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Brain Drain or Brain Exchange?

Hayden Glass and Wai Kin Choy

Abstract:

This paper explores the “brain drain” hypothesis – the idea that New Zealand is losing many of its most talented citizens to other countries. We conclude that we are experiencing more of a brain exchange than a brain drain. There have been net outflows of New Zealand citizens for forty years, and we have been replacing those leaving with non-New Zealand citizens.

On the basis of the data available, our immigrants appear to be more skilled than our emigrants (and than our general population). But there may be some cause for concern if immigrants cannot get jobs to make use of their skills.

Migration flows to and from Australia are different from those with the rest of the world. New Zealand consistently loses its citizens to Australia, but they are not just the highest skilled. Instead, they are representative of the general population of New Zealand. That is, there is no brain drain to Australia either, but what might be called a “same drain”. This is likely to be a consequence of the common labour market.

Policy responses could focus on both outflows and inflows. Limited policy levers exist for attracting and retaining New Zealand citizens within the country, other than making the country a more attractive place to work, and live. The key policy issue for inflows is the improvement of the selection, settlement, and integration of immigrants.

The paper ends by calling for a more sophisticated debate on immigration and emigration, and a more accurate conception of what will be an ongoing trend – that is, the increasingly free flow of people (including New Zealanders), around the globe.

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SUMMARY

There is concern that New Zealand is losing large numbers of its brightest citizens to other countries. Various interest groups have contributed to the debate on the presence and significance of the “brain drain” phenomenon. This paper examines the issues and evidence surrounding the “brain drain” debate.

Is a net outflow of people economically harmful?

Many brain drain discussions assume that a net outflow of people is unambiguously economically harmful, especially if those people are skilled. We review the theory on this point. It is not clear that a brain drain necessarily or unambiguously has an adverse effect on the economy.

The brain drain story is much more complex than it is usually portrayed

The bulk of this paper looks at the empirical evidence on the brain drain. Our conclusions are as follows:

New Zealand has a “brain exchange” with the rest of the world

- While there have been net permanent and long-term (PLT) outflows in the last three years, they are small and cyclical, and they follow a long period of net inflows. In the long term (e.g. 10-year and 40-year perspectives), **New Zealand continues to gain population** from migration. We replace departing New Zealand citizens with immigrating non-New Zealanders.
- Our immigrants are higher skilled than our emigrants (or than our existing population). Rather than a brain drain, the evidence seems to suggest a **“brain exchange”**. The important question is the extent to which immigrants are able to get jobs or start businesses to make use of their skills.
- There is a **drain of younger New Zealanders and a gain of adult non-New Zealand citizens**. Controlling for changes in the age distribution of the remaining population, age-specific emigration rates indicate that New Zealanders are delaying their departures until older ages.

New Zealand has more of a “same drain” with Australia

- There has been a **net outflow from New Zealand to Australia** almost every year since the late 1960s, and these flows are large and volatile.
- Those going to Australia are representative of the remaining population, rather than concentrated in the “high-skilled” category. Rather than a brain drain, the evidence seems to suggest a **“same drain”**, a consequence of the common labour market with Australia, which has allowed the migration of a broad mix of New Zealanders who might otherwise have been screened out by selective immigration policies.

These key points are summarised in the table below.

	NZ-Rest of the World*	NZ-Australia
Net Numbers	Inflow	Outflow
Skill	Brain exchange	Same drain
Age	Exchange young people for adults	

* Rest of the world means all countries, including Australia.

The brain drain debate raises policy issues for both inflows and outflows

The size of the net impact of migration flows is small relative to other influences on population numbers, although it is growing over time. Economic impacts of migration are ambiguous. The only conclusion that seems to appear consistently is that settlement processes are important as a way for immigrants to quickly start to use the skills that they bring with them.

One main policy issue raised by the brain drain is thus the adequacy of our selection and settlement policies to better help immigrants integrate into the labour market and New Zealand society. The importance of these policy levers will intensify in the future if migration is less likely to be permanent and long term. The option of building links with New Zealanders overseas (the diaspora) in order to tap their potential is worth further investigation, although concrete suggestions on how to actually do this have not yet been developed. The imbalance in migration flows to Australia has given rise to bilateral tensions, although policy opportunities may be available as well. Ultimately, we should focus on making New Zealand a better place to work and live in, to attract high-skilled immigrants and return migrants, and retain existing residents.

There is a need to move the public debate on immigration and emigration away from a reaction to short-term and volatile numbers, to a longer-term perspective, and towards a more sophisticated conception of what will be an ongoing trend – that is, the increasingly free flow of people (including New Zealanders), around the globe.

BRAIN DRAIN OR BRAIN EXCHANGE?*

1 INTRODUCTION

There has been much recent concern over the perception of a “brain drain” from New Zealand – that is, the notion that our brightest people are leaving the country in large numbers.¹ This paper considers the issues and evidence surrounding the brain drain debate. Some of the evidence in this paper has been alluded to in an earlier Treasury working paper (see Bushnell and Choy, 2001), which looks more specifically at trans-Tasman migration flows and policy tensions arising there from.

Section 2 outlines some of the theory and conceptual issues that might guide us in understanding why we should care about a brain drain. The key point is that a brain drain is not unambiguously a bad thing for the source country, although there would be a number of reasons to be concerned about large ongoing losses of highly-skilled citizens.

Section 3 examines the empirical evidence. We explore both the aggregate numbers of emigrants and immigrants, and their age and skills. The paper focuses on the aggregate picture, rather than specific occupational categories. As will be shown, the story is in fact much more complex than often depicted. Our strongest conclusion is that New Zealand has a “brain exchange” with the world, rather than a “brain drain”. In relation to Australia, New Zealand loses people, but they are not solely the high skilled. Instead, we have more of a “same drain” with Australia – that is, people migrating to Australia have similar skill patterns to the general New Zealand population.

Section 4 reviews the literature for evidence on the impact of migration on New Zealand and raises some implications for policy. Policy responses could focus on both inflows and outflows. For inflows, our main point is that the rules on whom we select to immigrate here (selection policy) and on how immigrants are assisted to integrate after they arrive (settlement policy) are the most important tools the government has to ensure that migration makes New Zealanders better off. The key policy issue for attracting and retaining New Zealanders is to improve the relative attractiveness of the country as a location for firms and people. The strategy to utilise the skills and networks of New Zealanders abroad is another policy response.

Section 5 summarises our key conclusions, and calls for a more sophisticated debate about the “brain drain” phenomenon. This is particularly necessary because the trend for freer and freer movement of people about the globe (which is the key driver of perceptions of a brain drain) is here to stay.

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¹ The term “brain drain” has negative connotations and may not be the best term for analysis. One alternative name, which is thought to be more neutral in connotation is the United Nations’ “reverse transfer of technology” (see Pomp, 1989). However, for simplicity and because of its prominence in the public debate, we shall use the term brain drain in this paper for convenience.

2 MOTIVATION

This section considers why we might care about a “brain drain” from New Zealand. There is no shortage of public comment that New Zealand is experiencing a brain drain. The picture painted is rather gloomy. Before we examine the empirical evidence to see if there is support for the existence of a brain drain, it is worth investigating more closely what underlies concerns about a brain drain, and whether these concerns are soundly based.

It is crucial to consider the longer-term (since many effects only emerge in the longer-term), and a dynamic picture (those who leave today might come back tomorrow). We also have to look at both inflows and outflows, and their composition. It is noted that other comparable countries such as Australia, Canada, France, Germany, etc. also have concerns about a “brain drain” to varying degrees.² Therefore, the issues raised in this section apply to them as well.

2.1 Well-being is the ultimate goal, and can be affected by both migrant numbers and migrant quality

Our analysis is based on the premise that the ultimate objective of policy is the promotion of higher living standards for New Zealanders.³ The concept of living standards is a rich and complex one; and income is clearly an important component. Higher incomes mean people can afford more and have more choices; it allows greater levels of consumption, more leisure, and a greater capacity for individuals to help those less fortunate than themselves. A higher income also implies greater means for the economy as a whole to provide education, health and other social services.

However there are many other components of living standards or well-being in addition to material well-being. The following quote from Claridge and Box (2000: 12) provides a useful summary:

“‘Living standards’, or well-being, encompasses many elements, both tangible and intangible. It is likely to include physical elements (eg health and security), material elements (eg employment and income), social elements (eg personal relationships, a welfare system), political elements (eg freedom of choice and action), environmental elements (eg clean air, leisure time) and elements that bring a sense of meaning (eg religious beliefs, cultural or national identity). This list is by no means exhaustive! Many of these components of living standards can be affected by government policies; some cannot.”

When we talk about a brain drain, we may be worried about numbers of emigrants and immigrants, or we may be worried about their attributes. Noting that we are ultimately concerned about the well-being or living standards of New Zealanders, the questions that are relevant to the brain drain debate are, therefore:

² For a review of the evidence on the brain drain concern in other countries, see for example, Smith (1997), DeVoretz and Laryea (1998), Carrington and Detragiache (1998), and Johnson and Regets (1998). It is noted that the brain drain concern is more serious amongst developing countries. In fact, in response to the large-scale movement of skilled labour from developing countries to developed countries, Bhagwati (1976) and others proposed a tax to transfer revenue to developing countries that experience a brain drain (see Bhagwati and Wilson, 1989).

³ See Treasury (1999) and Claridge and Box (2000).

- How do the numbers of people migrating into and out of New Zealand affect New Zealanders' living standards?
- How does the composition of people migrating into and out of New Zealand affect New Zealanders' living standards?

2.2 A concern over numbers of migrants could have a number of sources, including fears of loss of “critical mass”

There could be concerns over the *net numbers* of people migrating. A net outflow may be of concern if one believes that we need a certain critical mass to support the nation's development and progress. In other words, we need a larger population to achieve economies of scale and higher rates of economic growth and improved living standards.

Alternatively, the concern over the numbers of people leaving could be a psychological one, related to national identity or sovereignty. Some people just want the national population to be big. As a result of the large migration across the Tasman in the late 1970s, New Zealand has been portrayed as a “sinking ship”.⁴

Net outflows may not be the only cause for concern. If one believes that the people leaving and entering the country are different, there may still be concerns even if there were no net outflows. Similarly, a country may not be better off just because there are net inflows. Therefore, we need to look more carefully at *gross* migration flows, that is, the *composition* of both the inflows and outflows.

2.3 Concerns over migrant quality may be driven by the skills and age compositions of the workforce

Concerns may not be about *net numbers* of people migrating, but about the *composition* of immigration and emigration flows. Composition concerns could arise over anything that affects the well-being of people in their country.⁵ These different concerns are discussed in turn below.

2.3.1 A brain drain can affect skill composition in a number of ways – some raise welfare, some reduce it

In this section, we consider the link between well-being and the skill composition of migration flows.⁶ The main question is how the loss of high-skilled New Zealanders affects the living standards of remaining New Zealanders.

We have noted that income is a central component of living standards. The key to higher per capita incomes is productivity. Higher productivity means that more goods and services can be produced for the same amount of resources and effort. Many factors contribute to higher productivity (see Claridge and Box, 2000) – one crucial

⁴ See Trlin and Spoonley (1980).

⁵ Dimensions that are arguably important but not usually picked up by standard data collection procedures (i.e. passenger arrival and departure cards, as described later) include risk aversion, entrepreneurship, a “get up and go” attitude, etc.

⁶ While skill levels (often proxied by occupational categories) can be measured to some extent, there are still some limitations with the available data, as discussed later. These occupational data (to the extent that they are measured) are just proxies for people's ability to contribute productively to the economy.

factor is skilled workers. Skilled workers are better at creating, improving and applying new knowledge, which stimulates technological advance and thus productivity.

Migration can affect skill acquisition and therefore productivity, growth and incomes in a number of ways. We shall examine three mechanisms by which migration of skilled people affects productivity. The overall effect is ambiguous - migration may be “good” or “bad” for productivity.

A brain drain could be harmful if high-skilled and low-skilled workers are complements

Let's start with the production function where output is a function of capital and two types of labour – skilled and unskilled. What we want to know is how a reduction in skilled workers, as would occur with a brain drain, impacts on productivity.

The impact of changes in the skill composition of the labour force on production and productivity depends on the degree of complementarity between skilled labour and the other inputs of production – capital and unskilled labour. The impact of a brain drain on productivity depends partially on whether skilled workers compete with unskilled workers (are ‘substitutes’ for them), or enhance their productivity (are ‘complements’ for them).

There is empirical support for complementarity between skilled labour and capital (Krusell et al., 1997 and Golden and Katz, 1998). However, evidence on the degree of complementarity between skilled and unskilled labour is mixed.⁷ To the extent that they are complements, a reduction in the number of skilled workers, as would occur with a brain drain, would lower the average productivity of the economy, and hence the earnings of less skilled workers and the return on capital. It would also have the effect of raising the productivity of remaining high-skilled workers. The overall effect on productivity depends on the degree of complementarity and the shares of high- and low-skilled workers in the labour force. So, a brain drain *could* be harmful for the source country in aggregate.⁸

These kind of negative impacts are magnified under endogenous growth models

The “new growth” literature suggests that the negative implications of a brain drain on the source country are magnified. For example, Hague and Kim (1995) posits that the emigration of people with high levels of human capital reduces the growth rate of the effective human capital that remains in the economy, and thus generates the reduction of per capita growth in the source country.

Under this scenario, not only is high-skilled labour complementary with capital and low-skilled labour, but high-skilled workers enhance technological innovations and their diffusion. There could also be significant learning-by-doing. Regardless of the actual modes of learning and progress, the main implication is that a continuous outflow of high-skilled labour would deplete the source country's level of human capital and thus reduce the capacity of that country to achieve as much technological progress as other economies.

⁷ See Table 3.7 in Hamermesh (1993).

⁸ For an illustration of such a negative externality on the remaining population in the source country, see Bhagwati and Hamada (1974).

However, this does not necessarily mean that the source country is unable to catch up with others. It simply means that the engine of growth lies outside the source country, and that the country would have to rely on other countries to innovate and wait for those innovations to eventually get diffused. In addition, the country could focus on enhancing lower-skill technologies, and invest in education. Nevertheless, technological differences could well persist and this would translate to persistent differences in productivity levels and wages (see for example, Aghion and Howitt, 1992).⁹

The persistence in wage differences would result in a continuous departure of high-skilled labour whose skills, knowledge and experience are sought after in other countries (that is, a brain drain would continue to occur).

If positive externalities from education are significant, as emphasised by the “new growth theory”, then individuals cannot be expected to take these into account when making their private decisions. In this case, the departure of high-skilled workers may not be compensated for sufficiently by private investments in education, and thus the high-skilled workers will not be replaced by low-skilled workers who invest in training.

There is also an argument in the “new growth” literature that a certain scale is needed to support the creation of new technology and/or its adoption/diffusion. This argument suggests that there is much to gain from agglomeration effects and clusters, which puts New Zealand at a disadvantage because of the small scale of our economy and society, compared with other countries. Therefore, continuing net losses of skilled people would only further reduce the scope for such agglomeration benefits and the economy’s growth potential.

But these negative brain drain effects are challenged in more recent literature in models with endogenous human capital formation

Scenarios from the standard model of production and endogenous growth models reflect the “drain-of-brains” view that dominated migration research from the 1950s to the 1970s. However, these two scenarios ignore the fact that migration can induce skill formation. The standard and new growth models have recently been challenged in various theoretical papers that examine the impact of migration on human capital formation within a context of rationed migration flows (see Beine et al. 2001, and Mountford 1997).¹⁰

The theory assumes that workers weigh the costs of acquiring skills against prospective market rewards for enhancing skills, both at home and abroad, and make optimizing decisions.

The possibility of migration changes the opportunity set and the incentive structure. In particular, the assumed higher returns to education abroad create an incentive for the population to upskill and increase their human capital.

⁹ This is because in their model, technological advance results from purposive research and development activity, and this activity is rewarded by some form of ex-post monopoly power. If there is no tendency for the economy to run out of ideas, then the growth rate can remain positive in the long run.

¹⁰ Stark et al. (1997) provides a slightly different model with imperfect information and return migrations and find similar conclusions. When an economy is open to out-migration, the enlarged opportunities and associated incentive structures can give rise to a brain gain with a brain drain. In other words, notwithstanding the out-migration by high-skilled members of its workforce, the home country can end up with a higher average level of human capital per worker.

In the extreme, if there are large numbers of people trying to compete in the international labour market, then there will be an increase in the level of education acquisition in the home country. Given that only a fraction of the educated residents will emigrate (via some rationing device either from the destination country, or by the source country), the average level of education of the remaining population in the source country would increase. This is known as the ex ante “brain gain effect”.

The argument above depends on there being some rationing. Where there are free flows of people, the scope of this mechanism can be greatly reduced or even eliminated. For example, due to the lack of rationing under the Trans Tasman Travel Arrangement (TTTA) between New Zealand and Australia,¹¹ the strength of the argument gets diluted. It is unlikely that workers in New Zealand who upskill themselves in the expectation of higher returns to their skill in Australia will actually remain in the country. However, for other country destinations – where rationing still applies – the ex ante brain gain effect may hold.

The crucial question then is which effect dominates – the ex ante brain gain effect (migration prospects fostering investments in education because of higher returns abroad) or the ex post brain drain effect (i.e. educated agents actually migrating). If the first effect dominates, then the average level of human capital is higher in the economy open to migration than in the closed economy. In such circumstances, there will be a “beneficial brain drain” (see Beine et al. 2001, and Mountford 1997). This is an empirical question to be determined. Unfortunately, there is relatively little empirical work on this, as the following quote from Carrington and Detragiache (1999: 7) illustrates:

“More research, especially empirical studies, is needed to evaluate the impact of the brain drain on source economies and on worldwide welfare, as well as the reasons for such migration.”

Return migration reduces concern about a brain drain

A static picture can have very different implications from a dynamic one. Upon returning to the source country, some return migrants bring back skills, experience, and capital to be invested here.

If there is significant return migration, then the loss of highly trained personnel at any one time can have beneficial impacts on the source countries in the medium to longer run. This is why some people have labelled this a “*brain circulation*” rather than a “*brain drain*” per se (e.g. Johnson and Regets, 1998). The level of productivity and hence, the national welfare may rise if those skilled workers who went abroad return to the home country with improved productivities. The critical question then is whether there is in fact return migration and what the profile of migrants returning to the source country looks like.

We conclude that a brain drain may not be a bad thing for skills formation

In short, a drain of brains and a welfare gain need not be mutually exclusive. In fact, a drain of brains can be the very cause of a welfare gain if it stimulates human capital acquisition in those that remain, or leads to higher-skilled return migration. It is not

¹¹ Under the TTTA, New Zealanders could enter Australia freely to visit, live and work, and vice versa.

clear from the discussion that a brain drain necessarily or unambiguously reduces an economy's human capital. It depends on which scenario and which effect dominates in reality.

2.3.2 A brain drain can change age composition

One reason why age composition may be important is because those in the working age population are usually assumed to be net contributors to the economy (particularly in the labour market).¹² Such contributions help determine what the standard of living is for the average person in the population. The age compositions of both inflows and outflows have an impact on dependency rates. Therefore, even if there are net outflows, one needs to look at the age composition of the flows. Large departures of very young and very old people who do not fall into the working age category arguably would not raise as much alarm as when there are large departures of working age people.

A related reason is that within the working age category (and quite possibly even for migrants not in the working age category), age is often equated with the amount and breadth of work or business experience that a migrant has. For example, an overall net loss of "young adult brains" (e.g. 20 to 30 years) may be compensated for by an overall net gain of "slightly older adult brains" (e.g. 30 to 40 years).

2.4 There are other reasons for concern about a brain drain also

Aside from the impact of skill and age compositions on economic growth, people's sense of well-being is also affected by emigration and immigration in many other ways. This subsection raises a few broader reasons why a concern may arise with migration flows. While some of these concerns are applicable to both immigration and emigration, others apply more to one or the other.

There are social impacts from emigration and immigration (see NZIER (1994, 1996)). For example, changes in the ethnic and cultural diversity can influence how current New Zealanders adjust to new residents and citizens and the changes they bring to national identity. There could be a lower critical mass for maintaining New Zealand culture, resulting in the potential erosion of national identity and culture. Another example is the resistance to change amongst some people.

Furthermore, immigration can affect income distribution (see NZIER (1994, 1996)). All these could then affect the social and political cohesion of the country (and ultimately alter its growth prospects (see Rodrik, 2000)).

At the family and individual level, people could have more personal concerns because their family and friends are overseas, and new migrants simply would not compensate for this.

A brain drain could also have significant negative effects for the remaining population in other ways including through:

¹² While this may sound too simplistic, it is nevertheless common to find analyses focusing on the working age population only. There is no doubt that as life expectancy increases, the definition of the working age population should change to reflect this.

- *Education investments* – Most education services are substantially funded by taxpayers, who therefore have an interest in getting a return on that investment in the form of taxes from the educated person over his/her life. To the extent that educated people take their accumulated education overseas with them, the implicit contract with taxpayers is thwarted. New Zealand taxpayers end up, in effect, subsidising the growth of other countries. The effect is stronger to the extent that the educated can avoid paying their contribution by avoiding taxes or student loan repayments.
- *Other fiscal costs* – New Zealanders qualify for subsidised health care by birth or by securing permanent residence. They can qualify for superannuation by working here for some years. There is a risk that New Zealanders will go overseas and avoid the tax that could be expected to fund these costs, and return to New Zealand for health care or for superannuation at the cost of those who remain behind.

2.5 We need to think carefully about whose welfare is relevant

While we argue that well-being is the ultimate goal, there is an issue of whose well-being we should be concerned with. The question is whether we should care about NZ *citizens* regardless of where in the world they are located, or only about *residents* in New Zealand. This can have implications on how we perceive the brain drain concern and thus, whether and how we should respond.

2.6 In summary, a brain drain is not unambiguously a bad thing

This section has covered various reasons why people might be concerned with a brain drain. There could be concerns over the net numbers of people migrating, or the skill and age composition of the workforce leaving. These concerns are also expressed in other countries; they are more serious in developing countries.

Although there are a number of reasons why departures, whether of total numbers or of particular groups of people, might harm the living standards of those who remain, it is important to consider return migration and the long-term dynamic picture before concluding that out-migration flows at any particular point in time are harmful for the source country.

It is not clear from the discussion that net outflows of people (i.e. a brain drain) and a welfare gain are necessarily mutually exclusive. In fact, a drain of brains can be the very cause of a welfare gain. It really depends on which scenario and which effect dominates in reality, and the perspective that one adopts. Ultimately it is an empirical question whether we have a brain drain, and whether it is a good or bad thing.

With this in mind, the next section looks at the data to see if there is, in fact, a brain drain. Section 4 then examines some evidence on the population, economic and social impacts of migration.

3 EMPIRICAL EVIDENCE

This section uses the available data to explore empirically the brain drain hypothesis. There are four main parts. The first outlines the questions that we cover. Secondly, we briefly highlight a few concerns about the quality of the data we use. The third and fourth parts, which form the bulk of this section, evaluate the *numbers* story and the *composition* story, consistent with the discussion in Section 2. The final subsection sums up the key points in this section.

3.1 Questions to answer

Section 2 highlighted concerns and issues that are likely to be important and relevant to the brain drain debate. These concerns and issues prompt the following questions,¹³ which will be addressed in this section.

Volume of flows

- What do migration flows between New Zealand and the rest of the world look like?
- How long do people arriving in New Zealand stay for and how long do those departing remain abroad?
- Do migration patterns differ if we look at the flows by citizenship?
- Where do migrants go to and come from?
- What do migration flows between New Zealand and Australia (i.e. trans-Tasman flows) look like?

Skills and age of flows

- How do the skill distributions of departures, arrivals and net flows compare?
- How do the age distributions of departures, arrivals and net flows compare?

3.2 Issues with the quality of the data

People coming to and leaving New Zealand fill in arrival and departure cards. The data are processed by Statistics New Zealand, and used to track trends in the flows of people over time. The arrival card records, *inter alia*, how long people have been away from New Zealand (for residents) or how long they intend to stay in New Zealand (if they are not residents). The departure card records how long people intend to be away from New Zealand (for residents), or how long they have stayed (for non-residents). From their answers on these cards, people are classified as either Permanent and Long-term (PLT) Migrants, who were away or intend to stay away from their home country at least a year, or Short-term Visitors, who were away or intend to stay away less than a year.

¹³ It is noted that not all the concerns and issues raised in Section 2 can be addressed due to the limited data available.

These arrival and departure cards are the primary source of international migration data.¹⁴ Theoretically, we could also use the passenger cards of our overseas counterparts. For example, Australian passenger cards can be tapped to analyse trans-Tasman migration (e.g. Carmichael, 1993c). However, this paper uses only New Zealand data.¹⁵

Box 1 briefly summarises the main caveats on the use of this data that have already been covered extensively in the literature.¹⁶ Some of these issues are further explained in the relevant subsections.

Box 1: Three issues arising from the use of arrival and departure cards

<p><i>Category jumpers</i></p> <p>Arrival and departure card information is used to categorise people as PLT migrants (who were away or intend to stay away at least a year) or short-term visitors (who were away or intend to stay away less than a year). People fill in the arrival and departure cards based on their intentions, but their intentions can and do change. Some people say they are going away for less than a year (so on departure are not classified as PLT), but stay away longer than a year (and on arrival are classified as PLT). Some people say they are going away for more than a year (and so are PLT on departure), but come home early (and are not PLT on arrival). This phenomenon is known as “category jumping”.</p> <p><i>Seasonality</i></p> <p>Migration flows (arrivals, departures, and net flows) have a seasonal pattern. This applies to both short-term and permanent and long-term (PLT) flows. For example, the number of people arriving in New Zealand tends to be very high in the month of December.</p> <p>However, the seasonality pattern has changed over time. In other words, not only are migration flows much larger and more volatile now than 40 years ago, the seasonal pattern is also far greater. Therefore, the impact of annual migration flows on the population structure can be quite different depending on whether one looks at March or September years (or other end dates). For example, net total migration flows added approximately 115,000 people to New Zealand's population during the 40 years ended September 2000, whereas the corresponding figure for the 40 years ended March 2000 is approximately 180,000. However, for other series, the overall findings will not change much as one shifts from one end-date to another.</p> <p>It is not proposed to discuss the criteria for choosing between competing end-dates here. Professor Bedford suggests that the March year is the most appropriate to use because it captures the end of the seasonal cycle (people have returned from their overseas holidays at Christmas and visitors have left after their holidays in NZ. It is also noted that March is always the month of the census in NZ precisely because this is a time when people tend to be “at home” (aside from students getting their tertiary study under way). Therefore, throughout this paper, we follow the general convention in New Zealand to analyse the data using March years, unless otherwise stated.</p>

¹⁴ The New Zealand census data is an alternative source of data on immigration. Although the census can ask more searching questions, provide supplementary information, and thus is arguably more reliable, it provides only five-yearly estimates and does not give us information on people who left New Zealand in between two consecutive census dates. This is clearly not sufficient, particularly when so many people can enter and leave the country over that period.

¹⁵ Some of the data used in this paper are readily available on the Information Network For Official Statistics (INFOS), while others are based on unpublished tables from the Customer Services Division of Statistics New Zealand, official yearbooks, and various other sources as detailed in the text and footnotes.

¹⁶ A more comprehensive discussion of the data sources, assumptions and limitations can be found in Carmichael (1993d), Carmichael et al. (1993), and the other articles in the volume edited by Carmichael (1993a).

Occupational data

Occupation data is collected on all arrival and departure cards for all passengers but is coded and thus available only for permanent and long-term (PLT) arrivals and departures. Data on occupational categories are not very reliable. The very large number of “not actively engaged” or “not specified” cases calls into question the reliability of these skill breakdowns. Furthermore, the data series is not very long, with comparable information only available back to 1992. Earlier data on occupational categories (pre-1992) had different occupational classifications.

Because of these data quality concerns, one should avoid drawing too strong inferences and be careful when making conclusive statements based on the arrival and departure card data. Nevertheless, these are the only continuous data on international migration we have, and they are amongst the best of their kind in the world. We need to bear in mind the caveats above when using these data to test the brain drain hypothesis.

3.3 Net inflows and exchange of citizens

This subsection begins by examining the numbers of arrivals and departures between New Zealand and the rest of the world. The rest of the world here means all countries, including Australia. We then investigate these migration flows by citizenship, as well as where migrants come from or go to. Following that, we take a look specifically at migration flows between New Zealand and Australia.

3.3.1 We gain more people than we lose over the longer-term to the rest of the world

Typically, the debate on the brain drain focuses on permanent and long-term migration (PLT) migrants, since flows of short-term visitors are either assumed to be irrelevant to the brain drain question (implicitly because people who do not stay away long term have negligible human capital impacts), or because inflows and outflows of short-termers balance out over time. Most short-term flows are tourists, people visiting family, or business people.

The permanent and long-term (PLT) migration flows to and from New Zealand between 1961 and 2001 are shown in Figure 1 and Table 1.

Figure 1: PLT arrivals, PLT departures, net PLT and net total migration 1961-2001

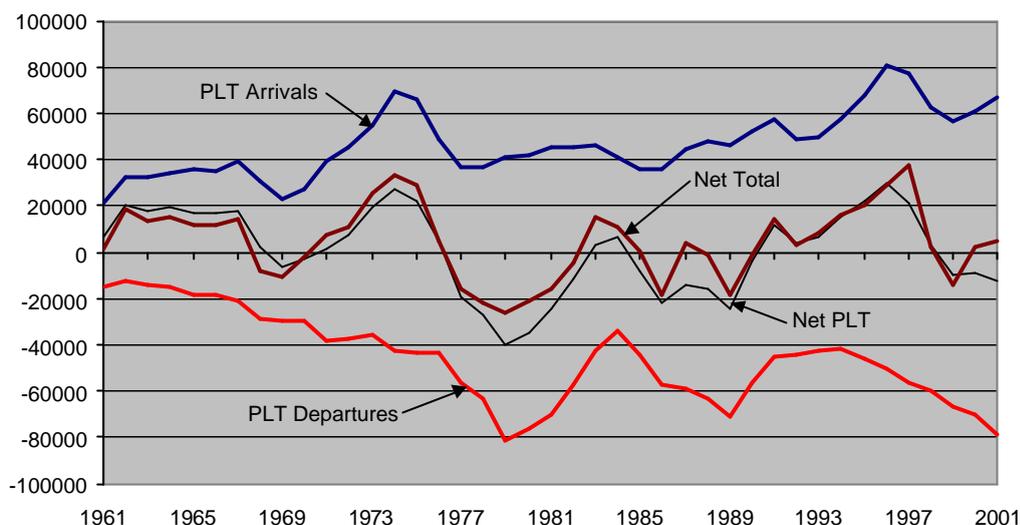


Table 1: PLT arrivals, PLT departures, net PLT migration, category jumpers¹⁷ and net total migration 1961-2001

Averages for	PLT Arrivals	PLT Departures	Net PLT	Category Jumpers	Net Total
1961-2000	46,224	44,954	1,270	3,253	4,523
1961-1970	31,147	20,287	10,860	-4,158	6,702
1971-1980	47,971	51,696	-3,725	6,264	2,539
1981-1990	43,948	55,437	-11,489	8,510	-2,979
1991-2000	61,829	52,395	9,434	2,398	11,831
1999 only	56,580	66,779	-10,199	-3,753	-13,952
2000 only	61,089	70,076	-8,987	11,136	2,149
2001 only	66,465	79,065	-12,600	17,558	4,958

The key points are:

- *There has been a net PLT outflow in the last three years* – In the years to March 1999, 2000 and 2001, PLT departures exceeded PLT arrivals by 10,199, 8,987, and 12,600 respectively.
- *The net outflow is relatively small and comes after a long period of net inflows* – The 1990s were a period of strong inward net PLT migration, averaging 9,434 per annum for the decade as against a 40-year average of 1,270.
- *The long-term trend is for a small inflow*– Over the last 41 years, PLT migration has added a total of 38,204 people to New Zealand’s population. Broadly speaking, the 1960s and early 70s were periods of net inflow. There were large net outflows in the late 70s and throughout the 80s (particularly at the end of each decade). The greatest net PLT outflow (40,200) was in 1979, and the largest net PLT inflow (29,832) was in 1996.

¹⁷ A negative number of category jumpers here indicates that overall people stayed away longer than anticipated or stayed in New Zealand less time. A positive number says that people stayed longer than anticipated or stayed away less time.

- *Arrivals and departures are both growing and more volatile over time* – Both PLT departures and arrivals have been gradually increasing over time. Net flows are a small proportion of total gross flows. In addition, large fluctuations in gross flows have been a feature of migration flows since the late 1960s (Lidgard and Bedford, 1999). Prior to this, inflows and outflows were smaller and more stable.

However, as explained in Box 1, using arrival and departure card information to categorise people as PLT or short-term migrants can be misleading. People fill the cards in based on their intentions, but their intentions can and do change. This phenomenon is known as category jumping.

Ideally, if we want to address the category jumping problem issue, we would need to link people's intended and actual duration of stay so that we can adjust the PLT flows with this category jumping component (either plus or minus, depending on the direction of the category jumping "bias"). However, we do not have the data to perform this direct linking.

There is a widely used proxy method to adjust for the category jumping component when calculating net gains or losses to the population over the long term (see for example, Bedford, 2001). This method uses total figures (i.e. short-term as well as PLT migrants) rather than only PLT figures.¹⁸ Intuitively, this method is based on the premise that over the long term (logically at least a year), the number of short-termers in should equal to the number of short-termers out. If there is a discrepancy in these two figures, it represents category jumpers.¹⁹ The number of category jumpers is displayed in Table 1, alongside the other flows.

Category jumping has a significant impact on the brain drain story. From Table 1, we can see that a standard PLT focus shows that there was an average net inflow of 1,270 over the 1961-2000 period. Accounting for category jumpers, the net total migration figure (in terms of the actual net flows of those who went or came for more than a year) was 4,523 per year over the same 40-year period.²⁰

This observation can also be gleaned from Figure 1, when one compares the net PLT and net total lines. The two series have broadly similar trends, except that net total appears to be larger than net PLT for most years. In other words, ignoring category jumpers would have understated the contribution international migration has made to New Zealand's population during that period. This highlights the inadequacies of an analysis of overall net gains and losses that is focused solely on PLT data. Unfortunately, some key data (like occupation, as evident later) is available only for PLT migrants.

¹⁸ However, it is noted that while net total figures adjust for category jumpers, they may also include some other groups. Therefore, it is not a perfect adjustment method.

¹⁹ Category jumpers = short-term arrivals – short-term departures. Therefore, a positive number indicates that overall, people stayed longer than anticipated or stayed away less time. On the other hand, a negative number indicates that overall, people stayed away longer than anticipated or stayed in New Zealand less time.

²⁰ Relatively small differences between net PLT and net total migration figures in any particular year can still add up to a large difference when accumulated over a long period of time. For example, the cumulative difference between the two figures summed over the 1961-2001 period (March years) is 147,693. In addition, the cumulative difference can be sensitive to the time period chosen (e.g. 1960s, 1970s, 1980s, 1990s, or all four decades), as evident from Figure 1.

Category jumping has a far more significant impact on the figures for New Zealand citizens than on those for non-New Zealand citizens (see Bedford 2001). It is also clear that category jumping (and hence the net total) is extremely variable over short periods.²¹ Looking at the three most recent years (see Table 1), the net total figure (-13,952) is lower than the net PLT figure (-10,199) in the year ended March 1999, but net total figures suggest there was a net gain in the years ended March 2000 and 2001 (2,149 and 4,958 respectively) in contrast to a net loss according to net PLT figures (-8,987 and -12,600 respectively). The variability of the net totals over short time periods underscores the importance of thinking about migration over the medium- to long-term.

The PLT outflow needs to be seen in context of a net gain of people in the rest of the last decade. The drain at the end of the 1990s “represents something of an aberration both for the decade of the 1990s, as well as for the longer-run experience of New Zealand’s international migration experience over the past 40 years”.²² It is also worth noting that previous drains at the end of the 1970s and 1980s have never been large enough or sustained enough to dislodge the long-term trend of a small net inflow. And the 1990s were the period of largest net inflows in the last 40 years.

It is also worthwhile comparing the total flows of migrants and visitors with PLT figures, as presented in Table 2 below. The total numbers are very large – in the year to March 2001, more than 3.2 million people arrived and left New Zealand. Figure 2 gives us a better idea of how short-term and PLT flows have changed over time. Growth in short-term departures over time has been much larger than growth in PLT departures. A similar picture is observed for arrivals.

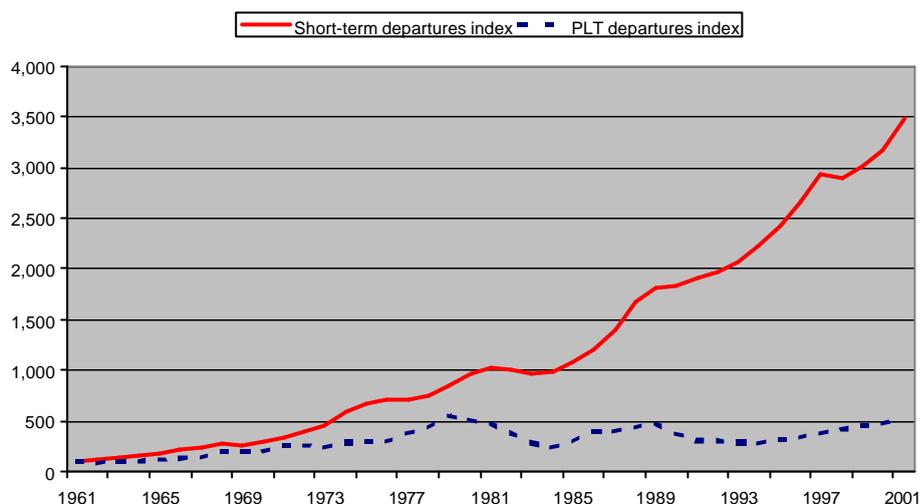
Table 2: Total arrivals and departures vs PLT arrivals and departures 1961-2001

Averages for	Total Arrivals	Total Departures	PLT Arrivals	PLT Departures
1961-2000	1,093,520	1,088,997	46,224	44,954
1961-1970	201,657	194,955	31,147	20,287
1971-1980	630,020	627,481	47,971	51,696
1981-1990	1,213,160	1,216,138	43,948	55,437
1991-2000	2,329,245	2,317,413	61,829	52,395
1999 only	2,755,895	2,769,847	56,580	66,779
2000 only	2,919,755	2,917,606	61,089	70,076
2001 only	3,218,995	3,214,037	66,465	79,065

²¹ Shevland (1999) reports that category jumping is highly correlated with relative economic conditions between New Zealand and other countries. If our local conditions deteriorate, those who plan to be away from New Zealand short-term may extend their stays away, while improved conditions might see those who departed intending to stay away long term coming home early.

²² Bedford (1999), page 2.

Figure 2: Growth in short-term and PLT departures index 1961-2001 (1961=100)



One important question that we are unable to answer here is how long people arriving in New Zealand stay on for and how long those departing remain abroad. As mentioned in Section 2, an important concern with the brain drain is if people do not come home or are not replaced by immigrants. Unfortunately, the arrival and departure cards only gather information on the length of trip from people who intend to be away, or were away, less than a year (i.e. short-termers).²³

Lidgard (1993) surveyed return migrants in the early 1990s, seeking a wide range of information including on their characteristics (including age, sex, marital status), their work experiences overseas and in New Zealand, the motivation behind their travels and plans for further mobility. Dr Lidgard has conducted a similar survey again in 2000, and this is still work in progress.²⁴

Her results from the early 1990s survey show that only 10% of travellers intended staying away longer than 5 years or indefinitely. Duration away was much longer for those returning from Australia than from the United Kingdom (reflecting visa requirements) – 76% of New Zealanders heading for the United Kingdom intended to stay away less than 2 years (and 74% actually were away that long), compared with only 40% (47%) of those heading to Australia. Those travelling to the United Kingdom tended to be younger, and more highly skilled.

²³ One source for the information on length of time away is the Immigration and Customs Services, who track the movements of all persons travelling across the border. Information is gathered at the port of departure and arrival, and linked to individual passport records. It is possible to use this data to calculate an average length of stay away. This information also includes data on age and gender, as well as nationality. However, the Immigration Service's computer system (AMS) contains this data only back until 1994 and the Customs Service (CUSMOD) has this data dating from 1992. In neither case is the data series really long enough to get an idea of whether there are significant business cycle trends. Nevertheless, it does provide one of the only ways to get at the question of the length of time people stay away, although it will be a non-trivial task since there are more than 10 million relevant records in CUSMOD.

²⁴ Dr Lidgard presented this work in progress at the New Zealand Association of Economists conference at the end of June 2001.

Just over three quarters of those travelling to the United Kingdom were primarily motivated by the desire to travel – often combined with the need to work to support that desire. Only 30% of those from Australia cited travel as their most important motivation.

Family ties were uniformly the most important reason for coming home. Around a quarter of those coming back from the United Kingdom stated that they were “forced” to return – with the expiry of a residence permit a key push factor.

Early results from the 2000 survey show similar results. The groups of people who go to Australia are likely to be staying away longer, and to be less motivated by the desire to travel than those groups that go further afield.

Now that we have looked at the total flows between New Zealand and the rest of the world, one might ask if NZ citizens have different migration patterns to non-NZ citizens. This is addressed next.

3.3.2 We lose New Zealand citizens and gain citizens from other countries

New Zealand citizens behave substantially differently from citizens of other countries. The net inflows over the long run in Section 3.3.1 mask significant outflows of New Zealanders and inflows of citizens of other countries. Table 3 and Figure 3 show data on net migration by citizenship for March years²⁵. The main points are:

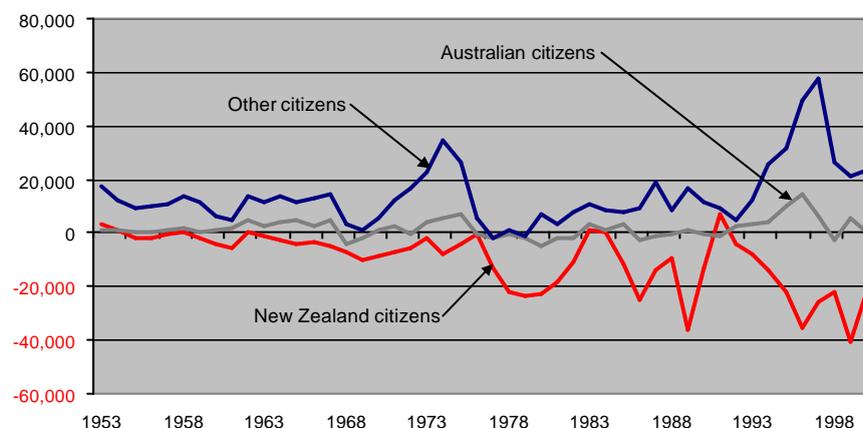
- *There is a long term trend for net outflows of New Zealanders* – Over the last 47 years we have lost almost 484,000 New Zealand citizens, an average of just over 10,000 every year.
- *Growing departures by New Zealand citizens have been driving the net losses recently* – PLT departures of New Zealand citizens have been growing since 1993. They peaked at almost 60,000 a year in 1979 and again in 1989. They are now close to this level again. At the same time, PLT arrivals of New Zealand citizens have been relatively static for the last 20 years. This higher level of departures by New Zealanders coupled with lower arrivals from other countries is driving the “brain drain”.
- *We are replacing New Zealand citizens with citizens of other countries* – We have replaced the 483,883 New Zealand citizens over the past 47 years with 81,159 Australian citizens, and 676,257 citizens of other countries, for a net gain of 273,533. As noted above, arrivals have run at particularly high levels in the 1990s. The average for the 1990s of 26,166 compares with a 40-year average of 14,089.

²⁵ Note that there is a longer time series here (going back to 1953). These earlier observations were kindly provided by Professor Richard Bedford.

Table 3: Total net migration by citizenship 1953-2000

For period	Averages				Totals			
	New Zealand	Australian	Other	All	New Zealand	Australian	Other	All
1953-2000	-10,081	1,691	14,089	5,699	-483,883	81,159	676,257	273,533
1953-1960	-762	844	11,505	11,588	-6,094	6,752	92,042	92,700
1961-1970	-4,758	2,060	9,400	6,702	-47,577	20,603	93,998	67,024
1971-1980	-10,837	1,045	12,330	2,539	-108,366	10,449	123,304	25,387
1981-1990	-13,512	9	10,525	-2,979	-135,120	86	105,249	-29,785
1991-2000	-18,673	4,327	26,166	11,821	-186,726	43,269	261,664	118,207
2000 only					-21,880	228	23,801	2,149

Figure 3: Total net migration by citizenship 1953-2000



The next question relates to where people go to and come from, addressed below.

3.3.3 We lose people to Australia and get them from Asia – the picture for the United Kingdom is more mixed

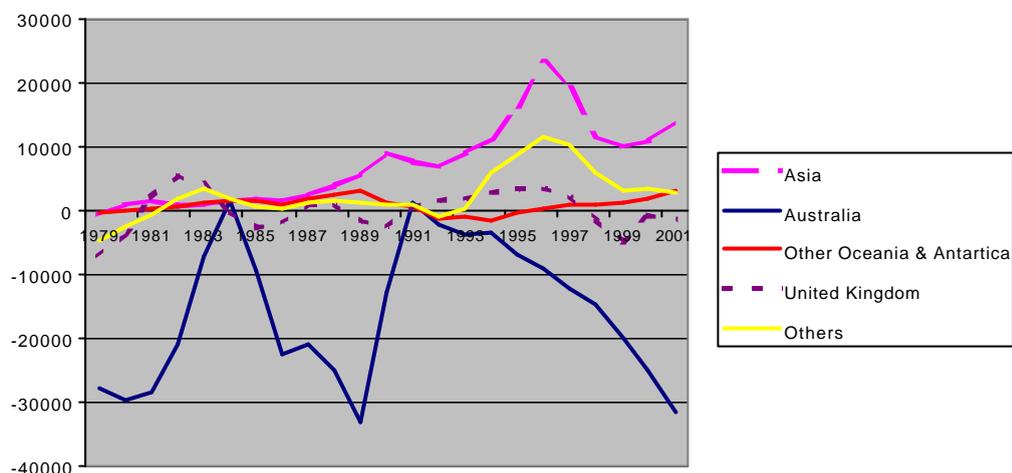
Figure 4 sets out the net migration position for different source and destination countries between 1979 and 2001. It confirms a well-known picture – in almost every year during the period shown, New Zealand has lost more people to Australia than it got back, although the extent of the flow varied substantially over time. At present, the net outflow is approaching the highest ever levels, met in the late 1970s and late 1980s. It is worth noting that the number of departures to Australia follows a far more erratic trend than that of departures to other countries. We shall elaborate on trans-Tasman migration flows in Section 3.3.4.

We have consistently gained people from Asia since 1979, and in the 1990s this trend has expanded considerably so that Asia is our biggest source region for PLT migrants. The picture with respect to the United Kingdom is more mixed with periods of net inflow and net outflow over the last 20 years (Bedford and Lidgard, 1997 and Lidgard and Bedford, 1999).

More disaggregated data show that about half of all people leaving over the last 20 years have gone to Australia, with the United Kingdom accounting for another 20%.

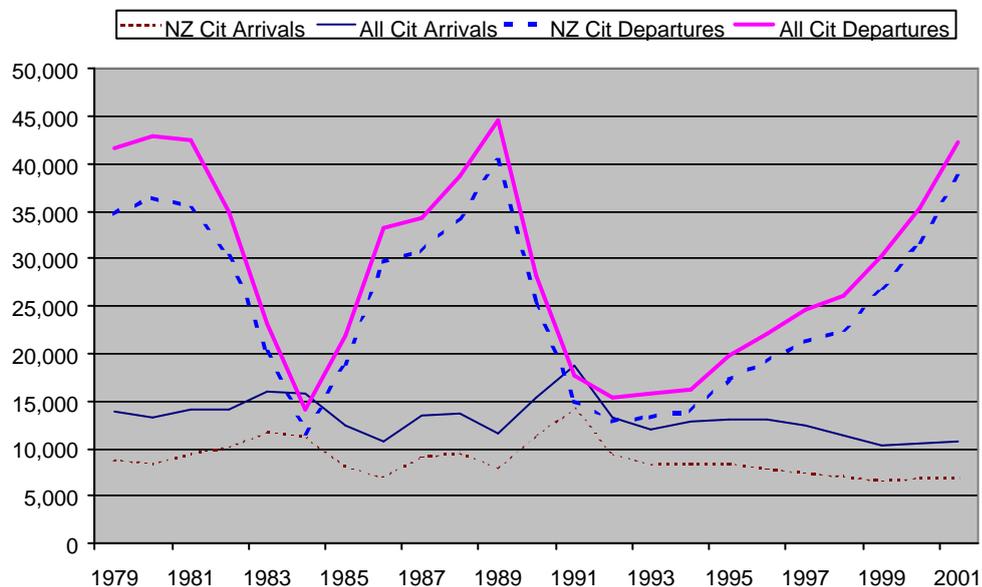
It is very important to keep in mind that these data are for PLT migrants only. Short-term flows and category jumpers are very important for source and destination country analysis (Lidgard and Bedford 1999).²⁶

Figure 4: Net PLT migration (all citizens) by Country of Last or Next Permanent Residence 1979-2001



One might wonder if the source and destination country analyses above would look different if we focus on NZ citizens alone. This is explored in the following two figures.

Figure 5: NZ Citizens vs All Citizens PLT arrivals and departures to Australia 1979-2001



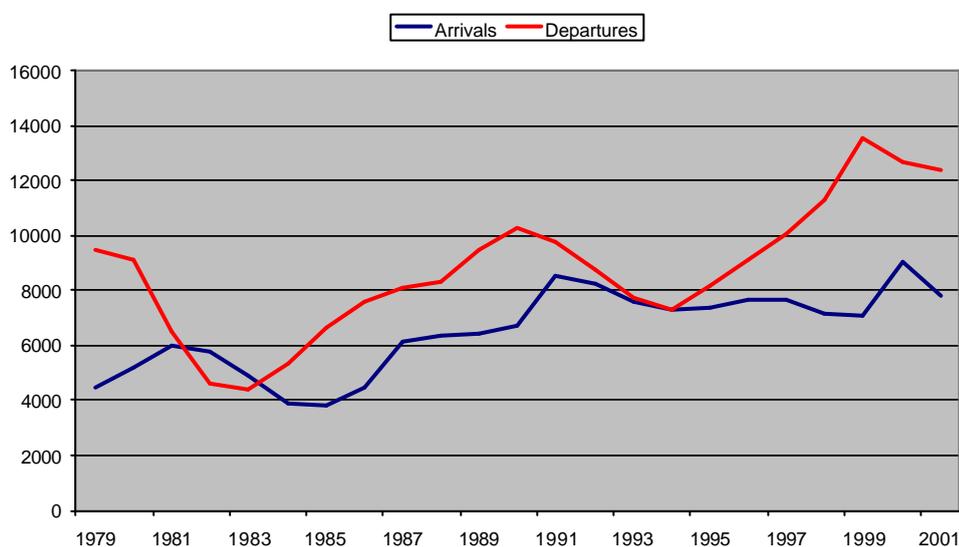
²⁶ Unfortunately, one cannot adjust the PLT figure for specific countries analyses in the same way one adjusts for the total figures for New Zealand. There are a few technical reasons for this (see Carmichael, 1993d). Without making it too complicated, it is sufficient to say that one main reason is that short-term movers handle the question on country of last/next permanent residence poorly (i.e. high non-response rates). While there are sampling errors for short-term data at the level of specific countries, this limitation does not affect data on total arrivals from and total departures to the rest of the world.

It is clear from Figure 5 that the majority of the PLT departures to Australia comprise NZ citizens. In fact, on average over the 1979-2001 period, NZ citizens formed 87% of total PLT departures. About 67% of PLT arrivals from Australia are NZ citizens on average over the same period.

New Zealand citizens are more likely to go to Australia permanently than to other countries, and, as we can deduce from Figure 5, New Zealand citizens who go to Australia are less likely to come home again. The proportion of departures going to Australia has been growing since 1991. At the same time, the number of New Zealand citizens coming back from Australia has been falling. Lidgard and Bedford (1999) report New South Wales government evidence that 20% of migrants arriving in NSW in 1997 and 1998 were from New Zealand, far outstripping the falling intake of British and Asian migrants.

The other major destination country for New Zealand citizens is the United Kingdom (see Figure 6, noting the difference in scale). The recent trends are similar to those for Australia. Departures have been growing since 1993, but at a much slower rate – departures to the United Kingdom have grown 175% since 1993, compared with growth of 256% for Australia. The number of New Zealand citizens coming home from the United Kingdom grew sharply in the mid to late 1980s, was flat for most of the 1990s, but has shown large growth in the last few years. Since 1996 the number of New Zealanders coming home from the United Kingdom has surpassed the number coming from Australia. For reasons that are probably related to visa requirements, a far greater proportion of NZ citizens who go to the United Kingdom come home again compared with Australia.

Figure 6: NZ Citizens PLT arrivals from and departures to UK 1979-2001



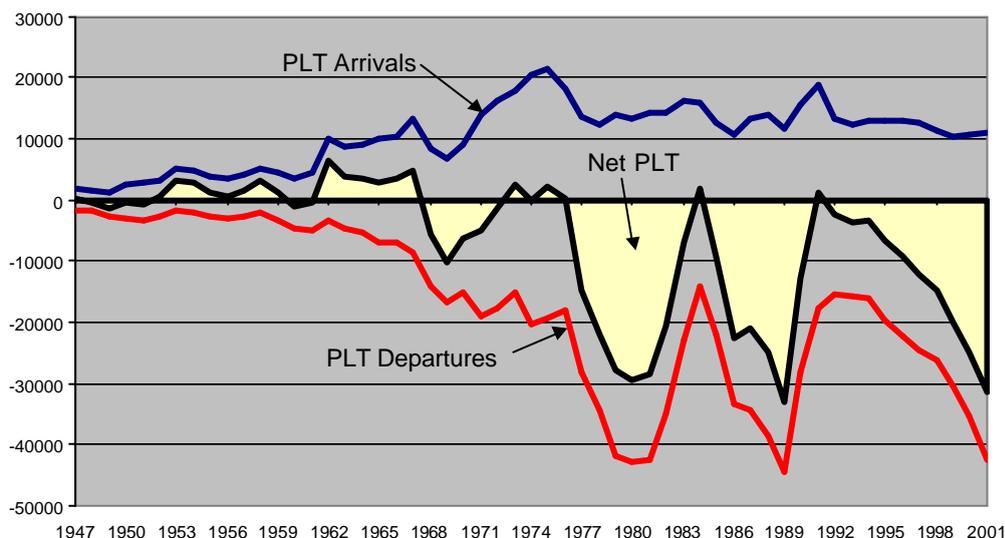
3.3.4 New Zealand-Australia flows grew markedly from 1960 – they are highly volatile but the net flow has been from New Zealand to Australia for more than 30 years²⁷

Regardless of whether one looks at total flows or flows of NZ citizens alone, it is clear that Australia is a major migration partner in terms of both an origin and a destination country. This sub-section discusses trans-Tasman migration flows in more detail.²⁸

In light of the long history of open labour markets between the two countries²⁹, the increasing economic integration and the small distance between them, it should not be surprising that many of departing New Zealand citizens go to Australia. In fact, over the past 20 years, about half of those departing have gone there. Note, however, that over the same period, Australia has been the biggest source country of gross arrivals to NZ.

The following figure shows the permanent and long-term migration between New Zealand and Australia since 1947.³⁰ Figure 1 illustrates both net PLT and net total migration, but Figure 7 uses only the PLT measure.³¹

Figure 7: PLT arrivals, departures and net PLT migration to Australia 1947-2001



²⁷ For an analysis of trans-Tasman migration in the 1980s using New Zealand data, see Farmer and Buetow (1993).

²⁸ See also Bushnell and Choy (2001) and references cited therein.

²⁹ As a result of the Trans-Tasman Travel Arrangement, the category jumping problem alerted earlier may be even more serious. *"The freedom New Zealand visitors have enjoyed to stay on in Australia almost certainly also has produced more category-jumping from short-term or long-term arrival to permanent departure categories than has occurred in other movement streams."* (Carmichael, 1993c, p. 69)

³⁰ Pre-1979 data for this figure were sourced from Pool (1980, p. 29).

³¹ For reasons explained in footnote 26, the migration flow to and from Australia are not adjusted for category jumpers.

The key points to be noted from Figure 7 include:

- *Both inflows and outflows to Australia began increasing markedly from the 1960s*
- *Since the late 1960s, the net flow has been almost always from New Zealand to Australia – Before that, it was in the opposite direction.*
- *There are large and volatile departures from New Zealand to Australia – There have been persistent and increasing flows from NZ to Australia since the late 1970s, which have been very volatile, peaking in the late 70s, 80s and 90s. It is the variability in the departures flow from New Zealand to Australia that drives the pattern of net PLT migration.*
- *Arrivals from Australia to New Zealand are relatively steady – In contrast, the numbers moving from Australia to New Zealand have been less volatile, but still significant. Some of these will have been NZ citizens returning more than one year after departing³² but others will be Australian citizens.*

Now that we have looked at the numbers of people migrating, the next question is what has been the effect of these flows on New Zealand's stock of human capital? In order to answer this question, we need to know the composition of those arriving in and departing from New Zealand.

3.4 Our immigrants are more highly skilled and older than our emigrants

This section looks at the composition of the workforce and the effect of migration on the skills and age of our workforce. Migrants, of course, might also differ on many other criteria including their English speaking ability, ethnicity, attitudes towards risk, and so on. These attributes are not picked up by passenger cards data, and so are not covered below.

3.4.1 The data we have on skills suggests that our immigrants are more skilled than our emigrants and our general population

The issue here is whether the people emigrating are more highly skilled than the people immigrating. If so, then even a situation of numerical balance (where we gain as many people as we lose) will be of concern, since the overall skill level of the New Zealand workforce would be falling. On the other hand, if the net outflows were composed solely of the low-skilled or unemployed, we may be less concerned about a drain, at least based on human capital criteria.

As discussed earlier (see Box 1), there is only relatively unreliable information on the skills of migrants. This is based on the question on the departure and arrival cards that asks for travellers' occupations. In over half the cases, there are no data on the occupations of the migrants (further discussed in Box 2), and consistent data are available only since 1992. In addition, occupational data are available only for those who identify themselves as permanent and long-term migrants.³³ One should bear

³² For a discussion of the significance of returning New Zealanders, see Lidgard (1993, 1994) and Bedford and Lowe (1993).

³³ This precludes an assessment of whether the distribution of occupational categories is same for PLT migrants and short-term visitors.

these limitations in mind when making inferences using such data. Nevertheless, it is the primary source of data proxying for the skill composition of migration flows.

Box 2: Occupational data are not very reliable

The very large number of “not actively engaged” or “not specified” calls into question the reliability of these skill breakdowns. And the data series is not very long, with information only available back to 1992.

As mentioned in the text, approximately 60% of arrivals and just over 50% of departures fall into the “not actively engaged” (NAE) or “not specified” (NS) category. However, if one looks at the occupational data by age, the problem is not as serious. The proportion of PLT migrants aged between 15 and 50 years that falls into the NAE or NS category is about 10 percentage points lower than if we look at all age groups. This is because all those aged under 15 falls into the NAE or NS category and there is a high incidence of NAE or NS for those over 65 years. Nevertheless, even after removing those PLT migrants aged under 15 years and above 50 years, there is still a high incidence of non-responses.

The arrival and departure card information is also difficult to interpret. It is not clear whether the response refers to work status at the time of leaving the origin country, or expected occupational status on arrival, or something else entirely (Lidgard 1993). “Not actively engaged” does not mean the same thing as “unskilled”.

We can say something (but not very much) about the skills of arrivals in the “not actively engaged” category. The big hump in “not actively engaged” arrivals in the mid 1990s corresponds with rising numbers of immigrants. The high level of net inflows from North Asia and Other countries in Figure 4 support this point. Around half of the migrant intake qualifies under the skilled category (which means that the principal applicant has a high level of qualifications), but every principal applicant brings on average another 1.7 people with him/her who may or may not be skilled.

From the data available from departure cards we cannot say anything about the skills of the “not actively engaged” group who are departing. Given the sheer numbers involved, it is unlikely that all these people are studying, unemployed, or retired. The spike in “not actively engaged” or “unspecified” departures in 1998/99 could be unsuccessful migrants or on-migrants from the 1995/96 cohort departing.

In addition, there are a large proportion of migrants who jump category (see Table 1), i.e., those who come as short-term visitors and end up becoming permanent migrants. We know nothing about the skills of this group, although it might be possible to track the skills of some groups (like students) through their other interactions with the Immigration Service.

Following Glass (2001), different occupations have been sorted into one of three skills levels (high-skill (NZSCO³⁴ codes 1 to 3), semi-skill (NZSCO codes 4 and 5) and low-skill (NZSCO codes 6 to 9)).³⁵ The meaning of these terms is not exact, and that the terms are used for simplicity, rather than for precision.³⁶

³⁴ These major occupation groups are as classified in the New Zealand Standard Classification of Occupations (NZSCO).

³⁵ The classification that we use is the same as that in Shevland (1999), although the names are different. She uses the terms of Reich (1992) – Symbolic Analyst, In-person services, and Routine Production – in preference to high-skilled, semi-skilled and low-skilled. High-skilled here includes professionals, associate professionals, technicians, and managers. Meanwhile, the semi-skilled group includes clerks, service and sales workers. Finally, the low-skilled category basically includes people involved with routine production work, manual labour etc.

³⁶ For example, some relatively skilled tradespeople (one-digit NZSCO code 7) are included in the low-skilled grouping (see Humphris 2001).

Let's take a look at whether these data support the brain drain hypothesis. As with Section 3.3, we begin with flows between NZ and the rest of the world.

3.4.1.1 New Zealand-Rest of world flows show outflows just recently, but inflows of the high-skilled over the medium term

In this subsection, we analyse the skill composition of the total flows and of the flows of just NZ citizens. Comparable data on occupational categories are available only from 1992 onwards. However, Humphris (2001) has done some preliminary analysis on the main trends for the 1979-1991 period, and her results will be summarised further below.

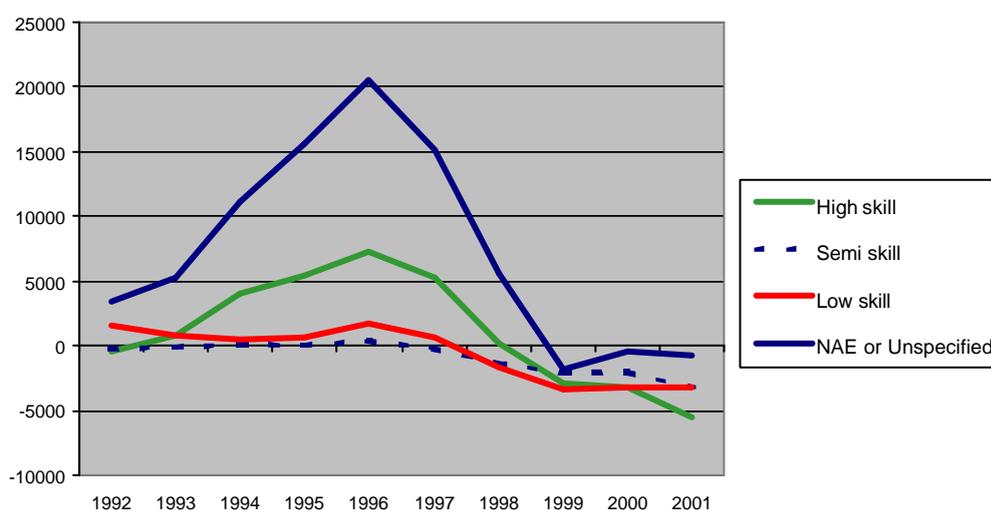
Table 4 and Figure 8 below show the skill composition of the net PLT flow, using the broad skill groups discussed above.

Table 4: Net PLT migration by imputed skill level 1992-2001

Year	High skill	Semi skill	Low skill	NAE* or not specified	Total
1992	-429	-218	1,503	3,431	4,287
1993	824	-118	806	5,336	6,848
1994	4,018	89	439	11,041	15,587
1995	5,416	41	582	15,658	21,697
1996	7,304	367	1,665	20,496	29,832
1997	5,249	-173	727	15,145	20,948
1998	254	-1,367	-1,712	5,532	2,707
1999	-2,850	-2,099	-3,359	-1,891	-10,199
2000	-3,197	-2,073	-3,272	-446	-8,988
2001	-5,468	-3,197	-3,218	-717	-12,600
Total	11,121	-8,748	-5,839	73,585	70,119

* NAE = Not Actively Engaged

Figure 8: Skill distribution of net PLT flows 1992-2001



The key points from Table 4 and Figure 8 are:

- *There is a net outflow across all skill levels recently* – Since 1999, more people have been leaving across all skill levels than have been arriving. This is what is popularly categorised as the brain drain. Given that the net outflows (and

departures, although not shown here) are across all skill levels, it might be better described as just a drain rather than a brain drain.

- *The small outflow of high-skilled is dwarfed by the size of the inflow earlier this decade* – We can say nothing about longer-term flows sadly, but we can say that, measured across the whole decade we have had a net inflow of those in high-skill occupations, and net outflows of those in semi- and low-skilled occupations.
- *Large (and variable) numbers are not actively engaged or unspecified* – Around 60% of arrivals (and growing) and just over 50% of departures are in these two categories. It is not clear how to categorise the skills of this group, as noted in Box 2. Over the whole decade (1992-2001), there were altogether 73,585 net PLT inflows that fall into this category, swamping the other skill-specified categories.

While we have seen the skill distribution of the net PLT flow, it is worth looking at the skill distribution of PLT arrivals and PLT departures individually.

For this purpose, we focus on those migrants who specify occupations that can be categorised into one of the three skill categories – high-skill, semi-skill and low-skill³⁷. In other words, those whose occupations were unspecified or not actively engaged are excluded. Since there are large (and growing) proportions of travellers who do not specify an occupation or are “not actively engaged” and we cannot tell the skill distribution of these people, the overall breakdowns should be treated with caution. The working assumption is that people’s propensity to not fill in the form or to be “not actively engaged” does not vary across skill levels. In addition, these figures cover only PLT migrants and we can say nothing about the skills of category jumpers, who are vital for making a more comprehensive assessment of the composition of arrival and departure flows.

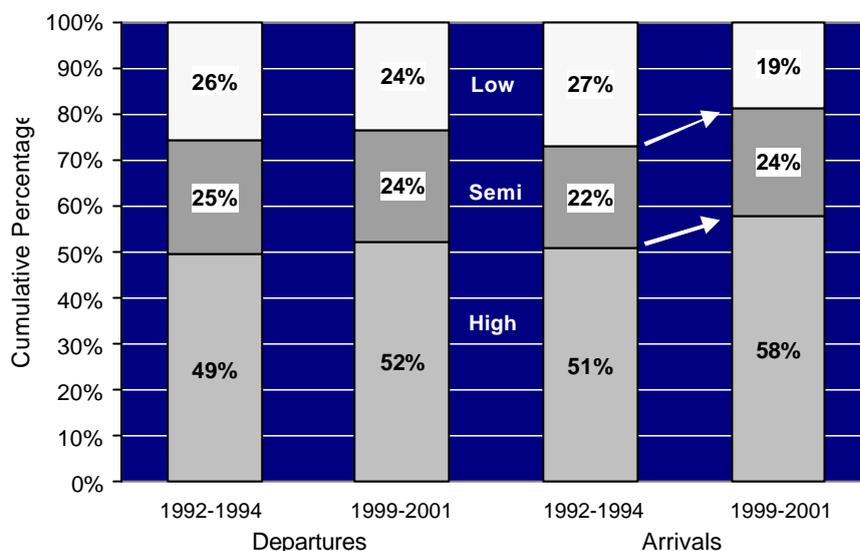
Table 5 and Figure 9 both show the percentage of PLT departures and arrivals in each skill category for each year from 1992 to 2001. Figure 9 compares the three-year average percentages at the *beginning* and *end* of the 1992-2001 period.

Table 5: Skill distribution of PLT arrivals from and departures to the Rest of the World 1992-2001

Year	PLT Departures			PLT Arrivals		
	High skill	Semi skill	Low skill	High skill	Semi skill	Low skill
1992	49%	25%	26%	46%	23%	31%
1993	50%	25%	25%	50%	23%	27%
1994	49%	25%	26%	56%	21%	23%
1995	47%	25%	28%	56%	20%	24%
1996	48%	25%	27%	56%	19%	24%
1997	50%	24%	26%	57%	19%	24%
1998	51%	24%	25%	58%	21%	21%
1999	51%	24%	25%	58%	24%	19%
2000	52%	24%	24%	58%	24%	18%
2001	53%	25%	22%	57%	24%	19%

³⁷ Our analyses on the skill composition of migration in- and out-flows from this point onwards use occupational data for all travellers whose stated occupations can be categorised into one of three skill groups (high-, semi- and low-skill), as explained in the text.

Figure 9: Skill distribution of PLT arrivals from and departures to the Rest of the World (3-year averages at start and end of the 1992-2001 period)



Notes:

The number of PLT arrivals and PLT departures over the two three-year periods whose specified occupations can be categorised into one of the three skill categories is shown below together with the corresponding total number.³⁸

	Departures		Arrivals	
	1992-1994	1999-2001	1992-1994	1999-2001
Total specified	64,435	92,983	71,349	64,250
Total specified & non-specified	129,107	215,920	155,829	184,133

The key points to be noted from Table 5 and Figure 9 are:

- *The skill distribution of those departing has not changed substantially over time* – Those leaving who specify an occupation are slightly more likely to be higher skilled in 2001 than in 1992. However, it is noted that it may be that the skill categories are too broad to pick up changes in occupation. This point is discussed further below.
- *Arrivals seem to getting more skilled over time* – The proportion of arrivals accounted for by the high-skilled has grown substantially over time, at least in the most recent years. At the same time, the proportion of low-skilled people arriving has fallen.

³⁸ Some people may suggest that a brain drain is a reduction in the *absolute* number of high-skilled workers. This perspective may apply if there are externalities or benefits from agglomeration, and if there is a certain critical mass below which a reduction in numbers of high-skilled will matter significantly. As far as we can see, there is no way we can determine what this critical mass is. Instead, this paper adopts another perspective (i.e. *proportions*), which focuses on the skill composition of inflows and outflows, in comparison with the skill distribution of the remaining population. Nevertheless, for the sake of completeness, the absolute numbers of arrivals and departures for each skill category are provided here.

- *A greater proportion of arrivals than departures are skilled* – The proportion of arrivals in the high-skilled category is greater than that of departures, while the proportion of low-skilled is greater for departures than for arrivals.
- *Both arrivals and departures appear to be dominated by high-skilled people* – Just over half the migrants in each direction are in the high-skilled category.

The figures in Table 5 and Figure 9 do not really tell us whether people departing from New Zealand to the rest of the world are representative of the remaining population in terms of their skills. To answer this question, we need to know both the skill pattern of departures and the skill mix of the New Zealand population. Figure 10 below shows how the skills of people migrating to the rest of the world compare with those of the remaining NZ population for the 1997-1999 period.³⁹

Figure 10: Skill distribution of PLT departures to the Rest of the World and the remaining population in NZ 1997-1999

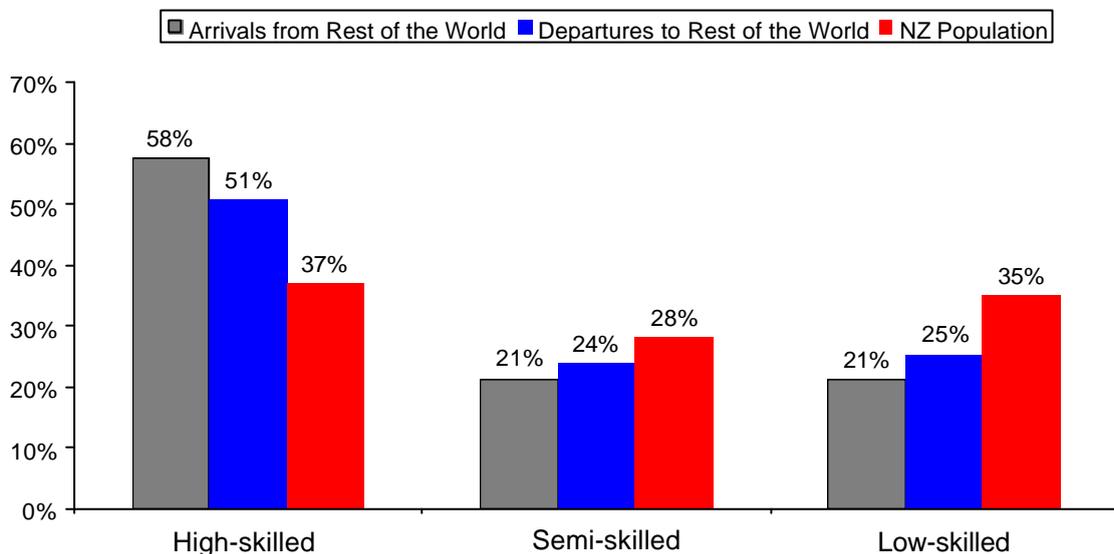


Figure 10 suggests that those departing to the rest of the world are more skilled than the local New Zealand population. This observation is also relevant in earlier periods such as 1992-1994. As will become clear further below, the picture is quite different for NZ citizens going to Australia (see Figure 13).

Having said that those departing to the rest of the world are more skilled than the remaining population in New Zealand, we need to place this observation alongside the high proportion of high-skilled people immigrating to New Zealand. In fact, Figure 10 shows that there is some evidence that people arriving are likely to be more skilled than those departing. In other words, when we look at migration flows between NZ and the rest of the world, there is a brain exchange, not a brain drain.

³⁹ The skill composition of PLT departures to the rest of the world is based on departure cards, while the skill composition of the New Zealand population is based on employment by occupational group data from the *Household Labour Force Survey*.

We have just examined the skill composition of PLT arrivals and departures between New Zealand and the rest of the world, as well as the skill composition of the remaining population in New Zealand. The limited data (with various caveats) that we have suggest that skilled people dominate the arrivals from and departures to the rest of the world. A net outflow (according to PLT figures) in the last few years thus implies that we are losing more high-skilled people than low-skilled people in net numbers. But when we look at proportions of flows in gross PLT arrivals and departures that fall into one of the three skill categories, arrivals are increasingly likely to be high-skilled, whereas the skill distribution of departures does not seem to have altered.

One might ask if this trend for total flows (i.e. for all citizens) would be the same for NZ citizens. This is examined next.

The story is the same for New Zealand citizens

Table 6 illustrates the skill composition of NZ citizens departing from and arriving in New Zealand. The same caveats apply with regard to the “not actively engaged” and “unspecified” categories and to using only PLT data. Similar trends are apparent. We already know that there are significant net outflows of NZ citizens driven by rising departures. This table tells us that both arrivals from and departures to the rest of the world are spread across the skill distribution, although they are dominated by high-skilled people. In terms of a trend, the skill distribution of those departing does not appear to have changed over time. We also know that number of arrivals have been reasonably static for NZ citizens. This table tells us that NZ citizens returning home who specify an occupation are more likely to be high-skilled, and a significantly lower proportion of arrivals are low-skilled people coming back in 2000 relative to 1992.

Table 6: Skill distribution of NZ citizens arriving from and departing to the Rest of the World 1992-2000

Year to March	Departures			Arrivals		
	High skill	Semi skill	Low skill	High skill	Semi skill	Low skill
1992	48%	26%	26%	43%	28%	30%
1993	48%	26%	26%	44%	27%	29%
1994	47%	26%	27%	47%	25%	28%
1995	45%	26%	29%	47%	25%	28%
1996	46%	26%	28%	47%	26%	27%
1997	47%	25%	28%	48%	25%	27%
1998	49%	25%	26%	49%	26%	25%
1999	49%	25%	26%	50%	27%	23%
2000	49%	25%	26%	51%	27%	23%

Comparing the figures in Table 6 with those in Table 5, we can see that non-NZ citizen arrivals are more likely to be high skilled than NZ citizen arrivals, i.e., our immigrants are, on average, higher skilled than our citizens coming home. This is supported by evidence from Winkleman and Winkleman (1998) that immigrants are more highly qualified than New Zealand citizens.

Part of the lack of trend in departures noted in Figure 9 may be because the skill categories are so broad. Partly it might also be disguising changes in the skill mix of the New Zealand population. To test this second point, we calculate occupation-specific outward migration rates for NZ citizens.⁴⁰

Table 7: Occupation-specific emigration rates for NZ citizens 1992-1999

Year to March	High skill	Semi skill	Low skill	All
1992	1.55%	1.13%	0.83%	1.17%
1993	1.42%	1.04%	0.77%	1.08%
1994	1.34%	1.02%	0.80%	1.06%
1995	1.45%	1.11%	0.92%	1.16%
1996	1.49%	1.13%	0.95%	1.20%
1997	1.68%	1.12%	1.00%	1.28%
1998	1.68%	1.16%	0.98%	1.29%
1999	1.80%	1.21%	1.05%	1.37%
% change 1992-1999	16%	7%	27%	17%

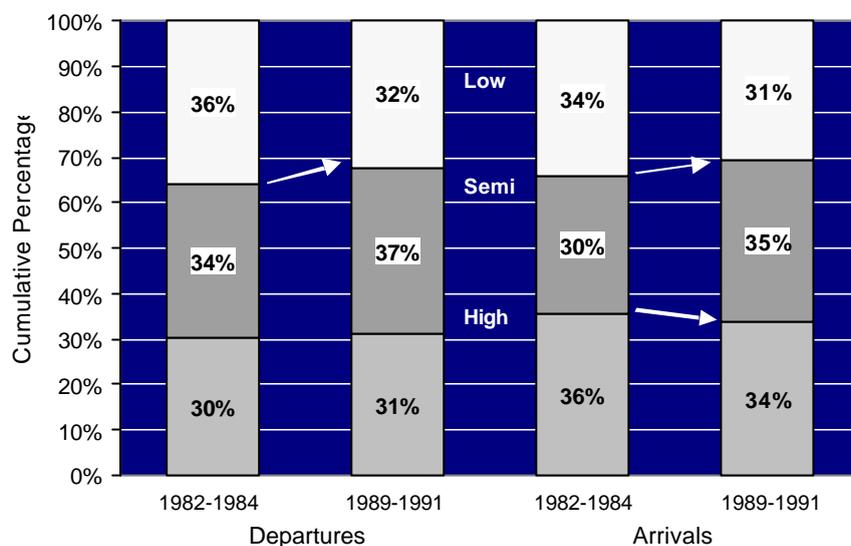
These occupation-specific outward migration rates explain the propensity of NZ citizens in particular skill categories to emigrate, while controlling for changes in the size of those skill categories in the New Zealand population. Across all skill levels, this propensity measure has grown 17% over the 1992-1999 period. However, the rise in the propensity to emigrate varies across the three skill categories. The increase in the probability of departing for high-skilled people is close to this average – with a 16% growth in the propensity measure over the same period. But, the chance of a low-skilled person leaving permanently in 1999 was 27% higher than in 1992. This suggests not a brain drain of New Zealanders, but an all skill or “same” drain.

There is evidence that changes in the skill mix of emigrants are cyclical. Humphris (2001) shows that when net outflows are high, the low-skilled make up a disproportionate portion of the departures. We are currently experiencing high net outflows, and so the trend of high net low-skill outflows may be showing up in this data. This suggests that the gap in propensity to depart may not actually be narrowing over time, contrary to what we observe from Table 7 above.

Up to here, we have seen the skill composition of PLT arrivals and departures amongst all citizens and for NZ citizens alone for the 1992-2001 period. It is worth taking a look at the pre-1992 data to see whether the trends over the 1982-1991 period were any different to trends over the 1992-2001 period. Note that the numbers using post-1992 data above are not directly comparable to those of the pre-1992 period.

⁴⁰ To calculate these rates, we have used employment by occupational group data from the *Household Labour Force Survey* as the denominator. For the numerator, we used occupational data from departure cards, which capture everyone whose stated occupations can be categorised into one of the three skill groups. Therefore, the numerator and denominator are not entirely consistent.

Figure 11: Skill distribution of NZ Citizens arriving from and departing to the Rest of the World (3-year averages at start and end of the 1982-1991 period)



As before, Figure 11 shows the percentage of NZ citizen⁴¹ migrants (of those who specify occupations) in each skill category for two 3-year sub-periods from 1982 to 1991.⁴² In contrast to the 1992-2001 period (see Table 6), preliminary analysis of the evidence suggests that there are fewer significant changes to the skill composition of arrivals and departures in the earlier period. The marginal changes include a slight fall in the proportion of low-skilled people in both departures and arrivals. These falls are accompanied by a corresponding rise in the proportion of semi-skilled people in both directions.

So, over the period 1982-1991, both arrivals and departures have become, if anything, more skilled. In contrast, over the period 1992-2001, while arrivals are increasingly likely to be high-skilled, the skill distribution of departures does not seem to have altered.

We have just examined the skill composition of the flows between NZ and the rest of the world. The limited data (with various caveats) that we have suggest that skilled people are more likely to migrate (that is, to leave or arrive). A net outflow (according to PLT figures) in recent years thus implies that we are losing more skilled people than low-skilled people in net numbers. However, when we look at proportions of flows in arrivals and departures that fall into one of the three skill categories, arrivals are increasingly likely to be high-skilled, whereas the skill distribution of departures does not seem to have altered. Looking at the data by citizenship, it seems that NZ citizens who are low-skilled are increasingly likely to leave relative to the total population, and there is overall growth in the chance of departure recently.

Next, it's worth investigating the same questions for flows between NZ and Australia.

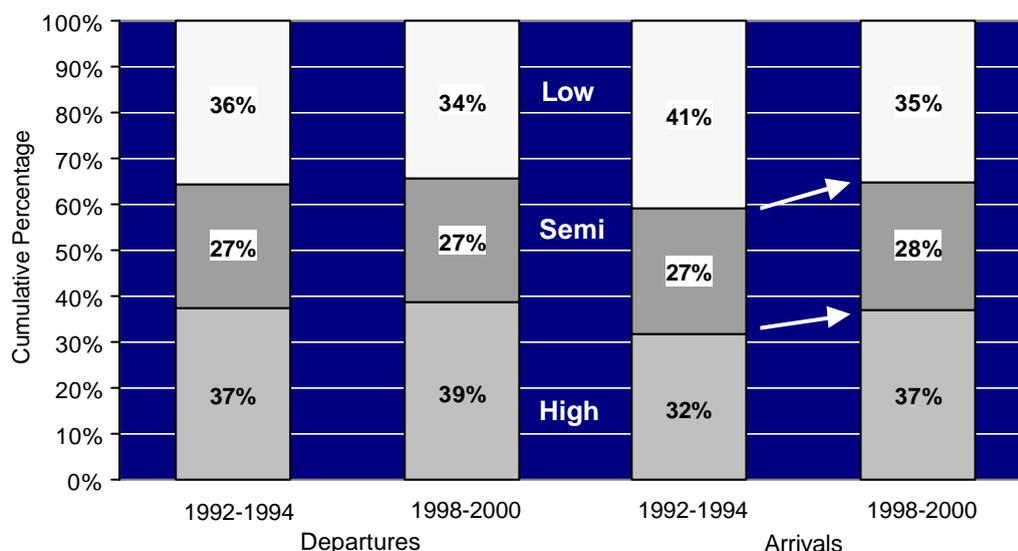
⁴¹ These data on skills of PLT arrivals and departures have been kindly provided by Janet Humphris from the Department of Labour. It is noted that this figure focuses specifically on NZ citizens only.

⁴² Although data is available from 1979 to 1991, we have chosen to calculate the three-year average percentages for 1982-1984 and 1989-1991, in order to compare the trends with the following decade (i.e. 1992-1994 and 1999-2001).

3.4.1.2 *Those crossing the Tasman are much more like the overall New Zealand population (i.e., less likely to be high-skilled)*

As discussed in Section 3.3.4, the evidence on NZ-Australia flows suggests a large and volatile net PLT outflow to Australia (driven mainly by volatile PLT departures). The majority (an average of 87% over the 1979-2001 period) of PLT departures to Australia comprise of NZ citizens, and this is the same for PLT arrivals from Australia, although to a lesser extent. This subsection thus focuses on the skill composition of NZ citizens.

Figure 12: Skill distribution of NZ Citizens arriving from and departing to Australia⁴³ (3-year averages at start and end of the 1992-2000 period)



The evidence in Figure 12 above suggests that the skill distribution of those going to Australia has not changed significantly from 1992-1994 to 1998-2000. In contrast, those arriving from Australia seem to be getting more skilled over the same period – the proportion of high-skilled has risen while the proportion of low-skilled has dropped. These two points were also observed when we looked at flows between New Zealand and the rest of the world (see Figure 9).

Figure 12 above also suggests that the proportion of trans-Tasman migrants (in both directions) in the high-skilled category is lower compared to migrants to and from the rest of the world. In other words, both arrivals from and departures to Australia are not as biased toward the high-skilled as the migration flows between New Zealand and the rest of the world.

Earlier, we saw some evidence suggesting that the departures from New Zealand to the rest of the world are more skilled than the remaining population. The question is whether this observation can be made about those going to Australia. This is shown in the next figure.

⁴³ The data on skills of PLT arrivals from and departures to Australia have been kindly provided by Sylvia Dixon from the Department of Labour. It is noted that this figure focuses specifically on NZ citizens only, and has not been updated to include data for 2001. Therefore, it is not directly comparable to Figure 10 for the NZ-Rest of the World analysis.

Figure 13: Skill distribution of NZ citizens departing for Australia and the remaining population in NZ 1997-1999⁴⁴

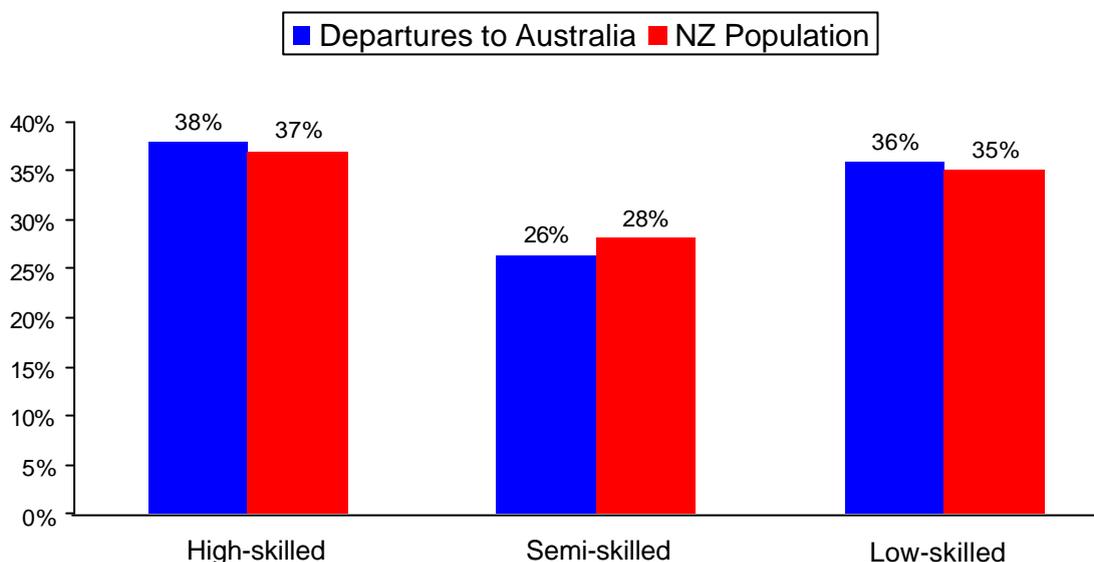


Figure 13 suggests that emigration of NZ citizens to Australia occurs across all skill categories roughly in the same proportion as the population as a whole. This observation is also relevant in earlier periods such as 1992-1994.

Shevland (1999) supports this, showing that the skill distribution of New Zealand citizens emigrating to Australia is similar to that of the population as a whole. Those going further afield are a much smaller proportion of total departures, but they are significantly more likely to be high-skilled. This is a reflection of the focus of immigration policy in other countries on attracting skilled migrants.

Lidgard (1993) reported that those going to the United Kingdom were more likely to be in the more skilled groups, while those going to Australia were more likely to be in low-skilled or in the “unemployed” or “not actively engaged” groupings. In other words, those departing to countries other than Australia tend to be higher skilled. The difference in the skill mix is likely to be due, in large part, to the free entry into Australia under the Trans-Tasman Travel Arrangement, which allows movement regardless of formal skills.

However, it may be that, while the occupational distribution of those going to Australia is similar to the general population, emigrants are actually of a higher quality in some way that occupation does not pick up. New Zealanders in Australia do better in the labour market on some measures than the Australian born or than other migrant groups (Shevland 1999). Emigrants may self-select for success in ways that we

⁴⁴ Figures 10 (NZ-Rest of the world) and 13 (NZ-Australia) are not directly comparable because Figure 13 focuses specifically on NZ citizens, while Figure 10 looks at all departures, regardless of citizenship. However, our conclusion that departures to the rest of the world are skill-biased but those going to Australia are representative of the remaining population is not affected. This is because the skill distribution of NZ citizens departing to the rest of the world (corresponding with Figure 10) shows that approximately 49%, 24% and 27% of NZ citizens departing to the rest of the world fall into the high-skilled, semi-skilled and low-skilled categories respectively. These estimates are very close to the ones for all departures regardless of citizenship (i.e. Figure 10).

cannot pick up in the data we have available. However, self-selection is unlikely to be as strong for those migrants going to Australia as for those going further afield.

As argued by some authors, instead of a brain drain, what we have is the consequence of a common labour market with Australia.⁴⁵ People have migrated because of employment and income prospects in Australia.⁴⁶ This is not a brain drain, which implies the departure of only the most talented. In fact, the main effect of the common labour market has been quite different to a brain drain. Rather than draining the high-skilled, it has allowed the migration of a broad mix of New Zealanders who might otherwise have been screened out of Australia, including low-skilled or semi-skilled New Zealanders.

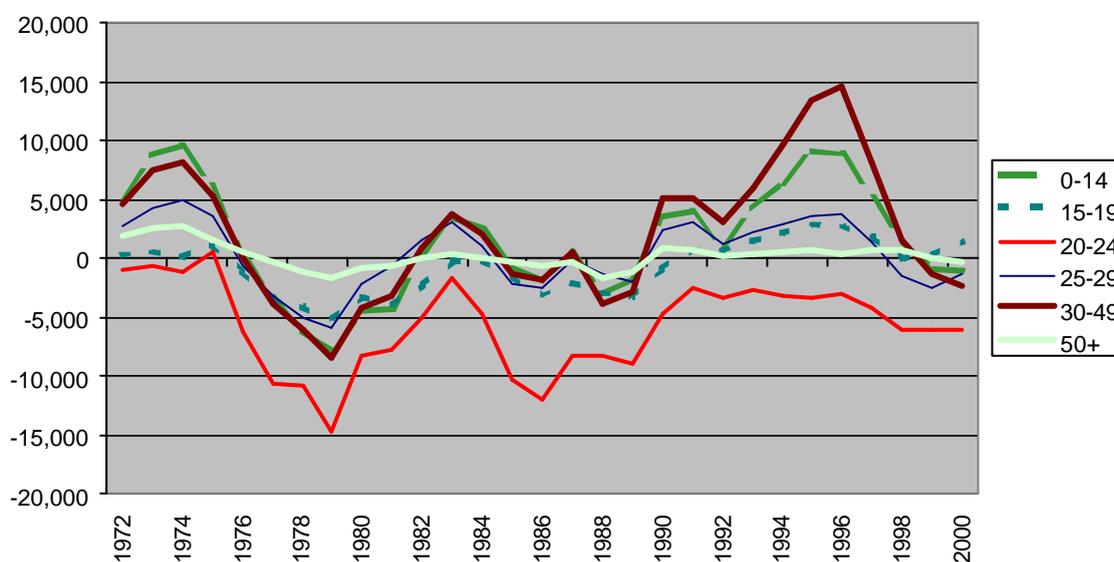
Let's now turn to another characteristic of interest – age.

3.4.2 Our immigrants are older than our emigrants

The main focus here is on flows between New Zealand and the rest of the world.

From Figure 14, we can see that more 20-24 year olds have left for more than 12 months than have come almost every year for the last 20. Generally, inflows are 25-29 year olds and 30-49 year olds who, we hypothesise, bring their children with them. The net number of 50 year olds arriving in or departing from New Zealand is relatively small and stable.

Figure 14: Net PLT migration by age group 1972-2000 (years to September)



Over time, PLT immigrants seem to be becoming older. From Table 8, the 20-24 year old age group made up 21% of all PLT arrivals during the 1970s, but just 13% in the

⁴⁵ According to some of these authors, trans-Tasman movements have more in common with internal than with conventional international population movements (see for example, Brosnan and Poot, 1987b, and McNicoll, 1993).

⁴⁶ The economic determinants of trans-Tasman migration have been examined in, *inter alia*, Brosnan and Poot (1987a), Poot (1993, 1995), as well as Nana and Poot (1996).

1990s. The 30-49 year old age group increased from 22% to 31% over the same time period.

Table 8: PLT arrivals and departures by age group 1972-2000 (years to September)

Percentages for	Arrivals						Departures					
	0-14	15-19	20-24	25-29	30-49	50+	0-14	15-19	20-24	25-29	30-49	50+
1972-2000	21%	9%	17%	19%	27%	7%	17%	10%	27%	17%	22%	7%
1972-1980	22%	9%	21%	18%	22%	8%	18%	11%	30%	16%	19%	6%
1981-1990	21%	8%	18%	20%	27%	7%	18%	10%	28%	16%	22%	6%
1991-2000	20%	10%	13%	18%	31%	8%	16%	9%	23%	19%	26%	8%

The age of those departing also seems to have increased. The proportion of PLT emigrants in the 20-24 year old age group has fallen from 30% in the 1970s to 23% in the 1990s, and there has been a commensurate increase in the 30-49 year old age group and, to a lesser extent, in the 25-29 year old group – the latter particularly in the 1990s. These changes in the age composition of departures reflect the overall changes in New Zealand's population composition – the population is ageing.

There are similar trends for New Zealand citizens. Table 9 below shows that PLT travel is being delayed. New Zealanders are likely to leave permanently later (although almost a quarter still leave between the ages of 20-24), and, if they come home, mostly they are between 30-49 when they do so. This could be a delayed OE – so that more young people are getting through university and working longer before leaving. Or it could be higher departures of dissatisfied migrants – who gained citizenship but have now decided to depart New Zealand permanently. Unfortunately, our arrival and departure cards have not included a question on place of birth since 1987 (although the question has been reinstated recently),⁴⁷ and so we cannot easily answer this question (Bedford 1987).

Table 9: NZ citizens PLT arrivals and departures by age group 1972-2000

Percentages for	Arrivals						Departures					
	0-14	15-19	20-24	25-29	30-49	50+	0-14	15-19	20-24	25-29	30-49	50+
1979-2000	18%	6%	20%	25%	26%	6%	18%	10%	29%	17%	21%	6%
1979-1985	19%	6%	24%	24%	22%	5%	20%	11%	31%	16%	18%	4%
1986-1990	17%	6%	21%	25%	25%	5%	17%	11%	30%	17%	20%	5%
1991-1995	17%	6%	19%	25%	27%	6%	16%	10%	29%	18%	21%	7%
1996-2000	17%	5%	15%	26%	29%	8%	17%	8%	23%	20%	24%	8%

Although not immediately evident from Tables 8 and 9, the overall story is that we are switching younger New Zealand citizens for older non-New Zealand citizens. We have a drain of younger New Zealand brains and a gain of adult non-New Zealander brains (see Bedford, 1999).

In order to better understand the story on the age of emigrants above, we need to look at age-specific emigration rates. Table 10 shows age-specific emigration rates for NZ

⁴⁷ Birthplace data recently became available from Statistics New Zealand, following the reinstatement of a birthplace question on the new arrival and departure cards. The processing of birthplace data commenced in July 2000 for arrivals and in September 2000 for departures. Initially, birthplace data were not available for a large percentage of the departing travellers (39 percent in September 2000) because the old departure card continued to be used along with the new departure card. However, by May 2001, the non-response rate had dropped to 3 percent for all departures.

citizens over the 1987-1999 period.⁴⁸ These figures explain the propensity of people in particular age groups to migrate and control for changes in the size of those age groups in the New Zealand population.

Table 10: NZ citizens age-specific emigration rates 1987-1999

Year	15-19	20-24	25-29	30-49	50+	All
1987	1.81%	5.91%	3.19%	1.05%	0.27%	1.68%
1988	1.83%	5.44%	3.25%	1.28%	0.38%	1.73%
1989	2.21%	5.64%	3.53%	1.52%	0.45%	1.93%
1990	1.83%	4.98%	2.85%	1.01%	0.31%	1.51%
1991	1.37%	3.99%	2.23%	0.71%	0.23%	1.14%
1992	1.10%	3.30%	2.07%	0.68%	0.24%	1.01%
1993	1.07%	3.04%	2.04%	0.68%	0.25%	0.97%
1994	1.11%	3.05%	2.04%	0.68%	0.27%	0.98%
1995	1.23%	3.38%	2.36%	0.75%	0.32%	1.09%
1996	1.24%	3.61%	2.61%	0.80%	0.37%	1.17%
1997	1.23%	3.88%	2.95%	0.88%	0.38%	1.25%
1998	1.25%	3.88%	3.21%	0.95%	0.40%	1.30%
1999	1.39%	4.35%	3.83%	1.15%	0.39%	1.47%
Averages for	15-19	20-24	25-29	30-49	50+	All
1987-1989	1.95%	5.66%	3.32%	1.28%	0.37%	1.78%
1992-1994	1.09%	3.13%	2.05%	0.68%	0.25%	0.99%
1997-1999	1.29%	4.04%	3.33%	0.99%	0.39%	1.34%

According to this measure, the likelihood of New Zealand citizens across all age groups emigrating fell from the 1987-1989 period to its lowest level around 1993 and then rose again over the latter part of the 1990s (see period averages⁴⁹ in Table 10). The drop in the propensity to depart from the 1987-1989 levels is not surprising since the late 1980s was a period of high departures (see Figure 3). Similarly, the rise in the likelihood of emigrating from the mid-1990s is consistent with the increasing departures of NZ citizens over that period.

Noting the effect of the starting year of comparison (1987), the probability of emigrating for a NZ citizen fell from 1.68% to 1.47% over the 13-year period. If we look at the individual age groups from 1987 to 1999, emigrants have grown older, with substantial reductions in the likelihood of 15-19 and 20-24 year olds emigrating, and substantial increases in the chances of 25-29 year olds leaving. There is a trend more recently towards convergence in the emigration rates of 20-24 year olds and 25-29 year olds – further evidence that young New Zealanders are delaying their overseas experience (hereon, OE), perhaps connected with the recent rises in tertiary education participation rates.

Humphris (2001) suggests that this rising age of departure could indicate that emigrants are leaving for longer periods – if they are older it may mean that departures are for longer-term work or career reasons rather than just OE or holidays. On the other hand, it could simply reflect that the returns from OE are higher if one has some work experience already. Dr Lidgard’s survey may give us better information here.

⁴⁸ To calculate these rates, we have used departure cards data as the numerator. For the denominator, we used data on the age composition of the total working age population from the *Household Labour Force Survey*.

⁴⁹ These are calculated as the average of the year specific rates.

While we have not looked closely at the age composition story for specific country analyses, it's worth noting some preliminary observations made by Bedford (1999). New Zealand citizens going to the UK are significantly more likely to be in the 20-29 year old age group. In contrast, for those going to Australia, the share aged 20-29 years was much smaller (see Bedford, 1999). To illustrate this point, in the year ended March 1999, 77 percent of the total net loss of 7,700 NZ citizens to the UK was in the 20-29 year old age group, while only 30 percent out of the 30,400 net losses to Australia fall under this age group (see Bedford, 1999).

3.5 A “brain exchange” with the world, and a “same drain” to Australia

While we risk doing some injustice to the statistics, we summarise here what we think are the key points discussed in this section.

Table 11: Summary of conclusions: Is there a brain drain in New Zealand?

Dimension	NZ-Rest of the World*	NZ-Australia
Net Numbers	Inflow	Outflow
Skill	Brain exchange	Same drain
Age	Exchange young people for adults	

* Rest of the world means all countries, including Australia.

New Zealand-Rest of the World: “Brain Exchange”

While there are net PLT outflows recently to the rest of the world, they are small, cyclical and follow a long period of inflows. In the longer term (e.g. 10 years or 40 years), **New Zealand is still gaining in terms of numbers**. If one insists on focusing on the shorter term, the headline statistic (net PLT) can give a misleading picture. Accounting for category jumpers seems to suggest net inflows recently. Another key point to note is the importance of thinking about migration over the medium to long-term. Looking at the data by citizenship shows a richer picture. Over the last 40 years, there is a trend for net outflows of New Zealand citizens almost every year. However, these departing New Zealand citizens are being replaced by a slightly larger inflow of citizens of other countries. Therefore, to date New Zealand has experienced a replacement migration or exchange, rather than a “brain drain”.

The limited data available on occupation seem to suggest that the skill pattern of departures to the rest of the world has not changed much over the last decade, whereas arrivals are getting more skilled, at least in recent years. Departures to the rest of the world appears to be more skilled than the remaining population. However, these skill-biased departures to the rest of the world have to be considered alongside the high proportion of high-skilled people immigrating to New Zealand. In fact, there is some evidence that recent arrivals have contained a greater proportion of people in the “high-skill” category than have departures. In short, there seems to be a **“brain exchange”**, rather than a “brain drain”.

New Zealand-Australia: “Same Drain”

Meanwhile, focusing on trans-Tasman flows, a large number of people (predominantly NZ citizens) are going westward, and these **net outflows** are volatile.

On the skills side, the flow of NZ citizens to Australia is not biased toward the high-skilled. Instead, it is fairly representative of the remaining population in New Zealand, hence the label “**same drain**”, rather than a “brain drain”. Some people have interpreted this as evidence of a common labour market between the two countries. The main effect of the common labour market has been quite different to a brain drain. Rather than draining only the high-skilled, it has allowed the migration of a broad mix of New Zealanders who might otherwise have been screened out of Australia, including low-skilled or semi-skilled New Zealanders.

Data on age of PLT migrants seem to suggest that the age of those departing and those arriving have increased. More disaggregated data reveal that we have a drain of younger New Zealanders and a gain of adult non-New Zealand citizens, hence the label “**exchange young people for adults**”. Controlling for changes in the age distribution of the remaining population, age-specific emigration rates further support the point that departing New Zealanders have grown older. In particular, the likelihood of emigrating for 15-19 year olds have dropped, while the chances of leaving for 20-29 year olds have increased.

Now that we have examined the available evidence on the nature of migration flows - numerically and composition wise – one might ask how those flows impact on New Zealand. The following section examines in more detail the implications of those migration flows in the brain drain context, and then teases out some implications for policy.

4 IMPLICATIONS

This section examines the implications of migration flows in the brain drain context, and then teases out some implications for policy.

Immigration has a relatively small influence on the total numbers of people in New Zealand, although the relevance of its impact is likely to grow over time (as natural population growth slows). Its impact is more important for the numbers in the labour force, and its impact on the stock of skills available in New Zealand is still more significant. A very important question is whether New Zealand makes the best use of the skills of its immigrants (through appropriate selection and settlement policies). There is evidence that migrants have difficulty adjusting at least soon after they arrive here.

We see three key policy issues raised by our investigation into the brain drain.

- First, the government must focus on making New Zealand a better place to be. Because the government cannot directly control the level of departures from New Zealand, if we would prefer lower numbers of people to leave, we need to focus on altering the choice of those who leave. While any *single* government policy is unlikely to make a significant difference (given that many leave simply from a desire to travel), government policies *in total* can make a difference, particularly in concert with other sectors.
- Second, the rules we use to choose migrants (selection policy) and to assist them to integrate (settlement policy) should be a key focus to ensure that migrants are able to get jobs and start using their high level of skills as soon as possible.
- Third, and more speculative, there is talk about trying to find ways to utilise the brains of New Zealanders while they are not physically present in New Zealand (the diaspora). As yet, there are few concrete suggestions for how to do this. However, this strategy is increasingly becoming part of the public debate and discussions amongst some academic circles.

4.1 Migration impacts in a number of ways

People are concerned about a brain drain because of their ideas about the impacts of such a phenomenon. These have been discussed in Sections 2.2, 2.3 and 2.4. In Sections 3.3 and 3.4, we examined the evidence on the *numbers* and *composition* of migration. This section pulls these two strands together by exploring the impact of the numbers and composition of migration. Put in another way, how are those international migration flows relevant to the brain drain debate in New Zealand? Migration has an impact for New Zealand in various ways. This section looks at the demographic, economic and social impacts of international migration.

4.1.1 Migration has relatively limited impacts on the size of the population, although these impacts are growing over time

This subsection considers the impact on the population of the outflows of New Zealand citizens and inflows of citizens of other countries. In particular, we consider whether international migration is a significant contributor to New Zealand's population

numbers, compared to natural increase (births minus deaths). The impacts of the new flows on population characteristics are considered in the following two subsections.

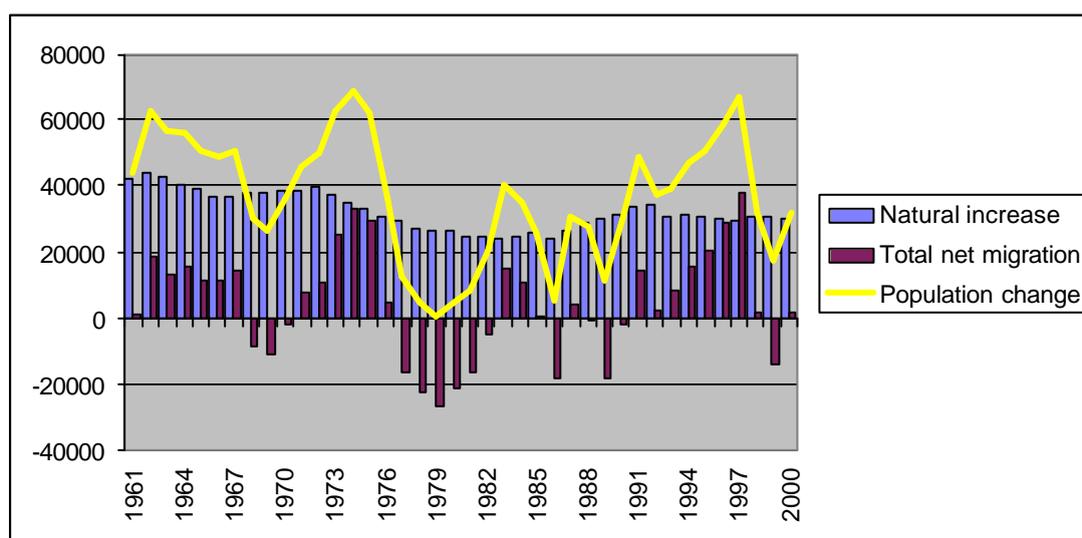
Over New Zealand's recent history, migration has been a relatively small influence on total population levels. In the 40 years to 2000, natural increase was responsible for almost 90% of population growth (see Figure 15). However, the share of population growth due to international migration is growing. In the early- to mid-1990s, immigration made a particularly large contribution to population growth – with immigration responsible for nearly 30% of population growth in the 1990s.⁵⁰

Migration gives a more erratic pattern to population change, which would otherwise be slower but steadier. As an example, only three times since the beginning of the twentieth century (in the years to March 1974, 1996 and 1997) has total net migration approached or exceeded natural increase in terms of its contribution to population growth.⁵¹ In the year ended March 1998, total net migration was just slightly positive (+1,923), the next year was 13,952 negative, and in the year to March 2000, there was a net migration gain of 2,149. This volatility underscores the importance, already mentioned, of looking at migration trends over the longer term.

The key point here is that the number of people lost through migration is generally small by comparison with the number of people gained by natural increase. In recent history, only in the late 1970s was net migration sufficiently negative to neutralise the impact of natural increase on population growth.

However, it is important also to note that the proportion of population change accounted for by migration is rising and will continue to rise as the population ages – with the number of births falling and the number of deaths rising over time. International migration will be the major driver of changes in numbers in the population in the future, especially after 2016 (Bedford et al, 2000).

Figure 15: Components of population change 1961-2000



⁵⁰ See Maré and Choy (2001) and references cited therein for a comparison of the role of international migration to other sources of population change.

4.1.2 The economic impact of the brain exchange depends in part on how quickly migrants can find jobs to start applying their skills

As discussed in Section 3, the evidence generally suggests that there is a brain exchange. But, are these immigrants contributing productively towards the New Zealand economy? In order to answer this question, we need to know how immigration and emigration impacts on the economy.

International migration affects both the demand and supply sides of the New Zealand economy⁵². The demand side is influenced through migrants' spending behaviour, business investment and the demand for government services. Migration also affects the supply side of the economy through the introduction of labour, skills, other forms of capital, technology as well as productive diversity via the knowledge of international business markets. The economic impacts are many and varied.⁵³

In Section 3, we argue that the evidence to date suggests that large numbers of NZ citizens departing are being replaced with even larger numbers of non-NZ citizen arrivals. While there is some evidence that migrants are likely to be more skilled (and slightly older), there still may be concerns about whether immigrants are offsetting the effects of people departing from the New Zealand labour market. The key point is not whether migrants are more highly skilled or not, but whether they integrate well enough into society to be able to make use of those skills.

Before we examine how well immigrants perform in the New Zealand labour market, let's take a look at how migration flows affect the total numbers in the labour force.

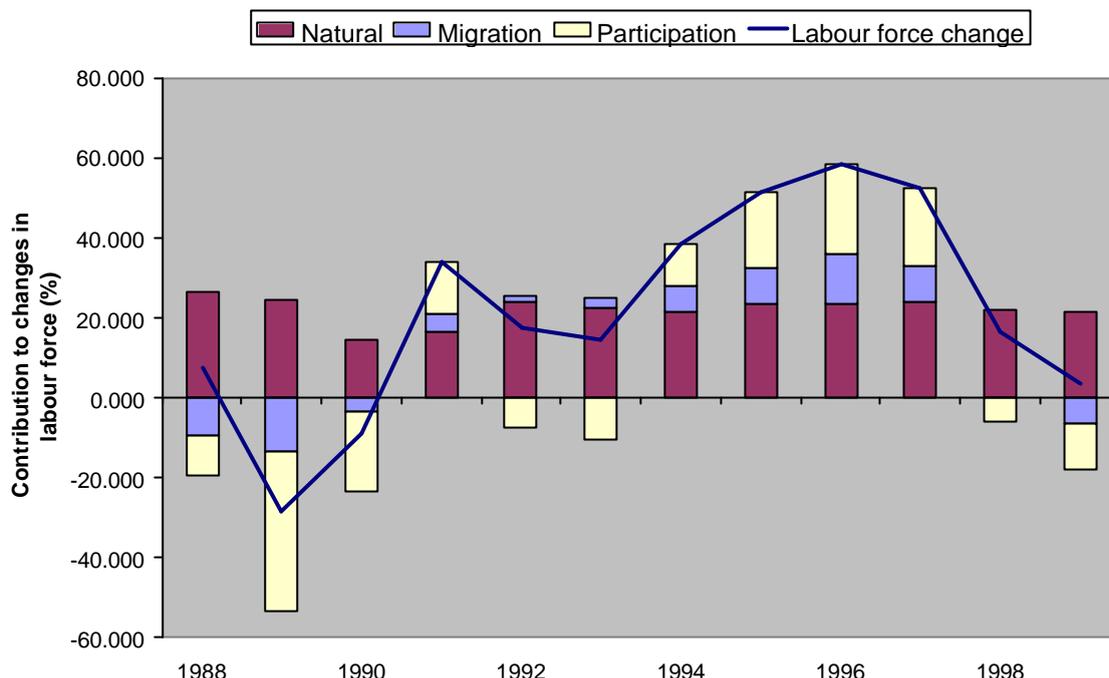
Figure 16 shows the influence of migration on total numbers in the labour force relative to natural increase in the working age population, and to participation changes (the proportion of those of working age actually in the labour force). Immigration is an important influence on the size of the labour force. In the period from 1994 to 1997, for example, PLT migration of those of working age contributed an average of 18% of annual growth in the labour force. But the impact of immigration is highly variable, as the figure shows. In the late 1980s immigration was partly responsible for net losses from the labour force. In the early 1990s immigration made little contribution either way, and its contribution became significantly positive in the mid 1990s, before falling away again at the end of the decade.

⁵¹ To see how net migration and natural increase compare in earlier periods (back to 1861), see Figure 5.6 in Section 5.3 of the *Statistics New Zealand Official Yearbook on the Web 1999* (<http://www.stats.govt.nz>).

⁵² As noted above, the different composition of the workforce leaving and entering the country can render the impacts of immigrants and emigrants quite different in reality.

⁵³ For a discussion of the macroeconomic effects of immigration with an application to New Zealand, see NZIER (1994, 1996 and 1998), and Poot (1998).

Figure 16: Influence of PLT migration on labour force 1988-1999



Bedford and Lidgard (1997) study the impact of international migration on the labour force age groups from 1986-1996 with similar broad findings. They show that labour force changes due to international migration were just 2% of population changes due to structural changes⁵⁴ over the 1986-1991 period, but the impact is extremely volatile – the corresponding figure for 1991-1996 was 42%. The volatility is driven by low net migration in the labour force age groups in the 1986-1991 period, followed by significant inflows for those age groups in the early to mid 1990s. The authors also noted the extremely variable impact on different age groups over time and the fact that, while the size of the contribution varied, international migration was consistently replacing New Zealand citizens of almost all labour force age groups with citizens of other countries.

The unemployment rates of recent migrants are typically high. Winklemann (2000) gives an overall rate of 35% for migrants in the first year of residence in New Zealand based on 1996 Census data. Rates were substantially lower for younger age groups, and those from English speaking countries, and up to 59% for migrants from South Asia. Similar results are cited in Bedford et al. (2000) in relation to specific ethnic groups.

Unemployment rates for new labour market entrants are frequently very high. The key question is what happens over time. Poot et al. (1988) present evidence that the likelihood of immigrants being unemployed decreases as time in New Zealand increases. The income of the overseas born who had been in New Zealand 10-14 years in 1981 could be “favourably compared” with the income of the New Zealand born. Pacific Islanders were particularly disadvantaged on arrival, but tentative

⁵⁴ Structural changes refer to the impact of natural increase (births minus deaths) and progressive population ageing.

evidence suggested that they experienced rapid declines in unemployment and increases in income over time. The explanation for the differences between overseas and New Zealand born focused on skills, and particularly on English language ability.

Results from Winkelmann and Winkelmann (1998) take this point significantly further. Their findings indicate that immigrants have a hard time integrating into the labour market over time – particularly those from Asia or the Pacific who do not speak English. A typical immigrant, despite being relatively highly educated, was likely to have a lower income and lower probability of participation and employment than a New Zealand-born person of the same age and education level in the first years after arrival. This entry disadvantage diminished with years of residence in New Zealand. However, there was substantial diversity in relative labour market outcomes. While immigrants from English speaking countries had relatively small initial differentials that tended to disappear within 10 to 20 years of residence, Asian and Pacific Island immigrants had larger initial differentials that were increasing over the study period, and, in some cases, these immigrants were predicted not to reach parity with NZ-born residents over their working career.

These results suggest that while net migration has added numbers to the New Zealand population over the longer term, the incoming migrants may, in fact, not be a complete replacement for citizens who departed (at least in the short run), despite being apparently higher skilled on average.

Another angle to get at the question of whether immigrants are good substitutes for those leaving the country is to assess the *fiscal* impacts of migrants to New Zealand. An example of such a study is BERL (1999a). This study focuses on the fiscal impact of the gross migration inflow, with no specific account of New Zealanders leaving. They focus only on the finances of the central government (i.e. they do not examine the impact of immigrants on local authority revenues and services). BERL (1999a) finds that on an age-adjusted per-capita basis, each migrant aged between 18-64 on average contributed over \$7,500 in income tax revenue in the June 1998 year, compared with \$7,600 for the corresponding NZ-born population. Meanwhile, each migrant aged between 18-64 accounted for approximately \$7,400 of government expenditure⁵⁵, compared with \$8,200 for each NZ-born individual, on an age-adjusted per-capita basis. These numbers clearly illustrate the over-riding importance of the respective groups' impacts on income tax revenue. In many cases, this impact overwhelms the estimated impacts on the other categories of central government's revenue and expenditure. However, BERL (1999a) acknowledges their estimates make no allowance for the *indirect* effects that may be attributable to migrants. Therefore, the report concludes by calling for an *economic* assessment of the impact of migrants on New Zealand, contrasting with their *fiscal* accounting estimates.

BERL (1999b) conducted a wide-ranging study for the Department of Labour on the influences on human capital. They try to get behind the numbers to some estimates of the value of international migration flows. Using occupation-specific wage rates, BERL (1999b) value the impact of the skills of *net* migration flows over the 1992-1998 period on the total stock of New Zealand's human capital. The seven-year average impact of net migration is under 0.5%. In the year of peak net inward flows (1996) the impact

⁵⁵ These include health, education and national superannuation benefits, as well as WINZ's (*Work and Income New Zealand*, now known as the *Department of Work and Income*) main, supplementary and emergency benefits, and student allowances.

reached 1%. But influences vary significantly across occupational groups – with an impact of 3.5% on the “Professionals” group in 1996.

Gross flow impacts of immigration were, unsurprisingly, somewhat larger. The seven-year average gave an impact from inward migration of around 2.5%, with outward migration at about 2%. In both cases the impact was largest on the highest skill occupational categories. Inward migrants tend to be replacing losses rather than augmenting the existing stock of human capital.

BERL (1999b) also estimated the impacts of other flows on the stock of human capital. The annual impact of the flow of tertiary educated people entering the labour force on the stock of human capital is around 1.25% overall, and 2% to 3% on the higher skilled occupational groups. By comparison, new entrants to the labour force added around 1% a year to the stock of human capital, and retirements subtracted between 0.5% and 0.75%.

BERL (1999b) notes that while the impacts of demographic influences (i.e. new entrants and retirements) appear small, these impacts occur consistently over long periods of time. In contrast, immigration flows vary quite substantially from year to year. It should be noted that the BERL (1999b) estimates do not include the impact of temporary flows of workers on the stock of human capital or on the labour force. There are more work permits (for up to three years) issued each year than residence permits, so the impact might be reasonably significant.

Finally, one could of course assess the macroeconomic impacts of migration. However, the evidence is far from conclusive, as summarised by the following quote from NZIER (1998):

“the macroeconomic impacts of immigration are ambiguous, and the effects on the welfare of incumbent New Zealanders complex.”

4.1.3 The social impacts of migration are significant, but difficult to analyse⁵⁶

The make-up of New Zealand’s population has changed dramatically over the past 15 years (see for example, Lidgard et al., 1998). Immigration (particularly when combined with large outflows of New Zealand citizens) increases the ethnic diversity of New Zealand’s population. The size of the impacts can be quite significant. Census data from 1996 reports that 17.6% of New Zealand residents were foreign-born. At current immigration rates, that share will further increase as both the departure of the New Zealand citizens and the arrival of overseas settlers pushes up the proportion of foreign-born. Between 1986 and 1996, the proportion of foreign-born among New Zealand residents grew by more than 2 percentage points, from 15.4 to 17.6% (Winkelmann 2000). There are also significant regional differences in the impact of immigration. While regions such as Nelson and Tasman have high internal inflow rates compared to international inflow rates (just over 20% of its total inflows are from overseas), Auckland has very high international inflow rates (just over 60% are from abroad) (see Maré and Choy, 2001). In fact, about a third of the population of Auckland is overseas-born.

⁵⁶ As noted earlier, NZIER (1994, 1996) has a more detailed discussion of the social and economic effects of immigration.

The social effects related to this change have been the introduction of more languages into New Zealand life (while retaining English as the common language), the growth of ethnic media, businesses, new foods and diverse religious and cultural activities.

Inward flows of people can enrich the country socially and economically - by bringing new skills, perspectives and networks, making us more cosmopolitan, and opening our eyes to different people, cultures and ways of doing things. The act of migrating suggests that these people may have more initiative, and be more willing to take risks than their counterparts who remain in their native country. However, international migration also present challenges for New Zealand. In the short run, immigration may also have costs, both economically (as discussed in Section 4.1.2) and socially (as current New Zealanders adjust to new residents and citizens and the change they bring to national identity). All these combined with the availability of an exit option for skilled people can have an impact on social and political cohesion, ultimately affecting a country's growth prospects⁵⁷.

4.2 Policy responses could focus on inflows, outflows or both

Given the evidence presented in Sections 3 and 4.1, this section looks at some implications for policy. It is noted that policies could target inflows, outflows or both. While selection and settlement policies focus on helping immigrants to integrate quickly into New Zealand, finding ways to tap the New Zealand diaspora is one way to cope with outflows. Policy questions relevant for both inflows and outflows include trans-Tasman issues and the ultimate objective of increasing the relative attractiveness of New Zealand. Each of these is discussed in turn.

4.2.1 High-quality migrant selection and settlement policies may help to ensure that immigrants are able to integrate quickly into New Zealand

Evidence points to a brain exchange (or a replacement migration), rather than a brain drain. In addition, evidence on the labour market outcomes of immigrants indicates that the degree of substitutability of immigrants for people departing from NZ is questionable. These suggest that New Zealand could perhaps gain by focusing on settlement issues and better helping immigrants integrate into the labour market.⁵⁸

Following from this, a few policy questions arise. For example, can enhanced settlement assistance provisions in fact be effective in overcoming the barriers that the more disadvantaged immigrants face, or are we expecting too much of settlement assistance? Another policy question is whether New Zealanders will still benefit sufficiently overall from the entry of migrants who do not do well without settlement assistance. Neither of these questions can be well answered at present, but they are obvious policy questions to raise.

Another policy lever we have is immigration policy. However, immigration policy directly affects only the arrivals of those who are not New Zealanders, Australians or those from the few Pacific Islands with which we have special arrangements. It is unclear whether it is sustainable to increase the level of inward migration much further,

⁵⁷ For a more comprehensive discussion of this link, see for example, Rodrik (1997, 1999, 2000).

⁵⁸ This point was highlighted by various people at the "New Directions: New Settlers: Research on Migration and Settlement Responses" seminar, organised by Professor Richard Bedford and Associate Professor Andrew Trlin from 11-12 April 2001.

given that it is already running at about 1% of total population. Nevertheless, there may be scope for screening immigrants better.

It is also worth noting that patterns of movement are changing and this can influence how immigration and settlement policies should be designed. There is an impression amongst some parties that international migration is all about people intending to settle permanently in a country, or at least intending to stay for a very long time. The terms “permanent and long-term migrants” and “settlers” are thus commonly used.

However, as globalisation trends continue, evidence suggests that migration is less likely to be permanent and long term (Bedford, 2001). People come and go, and travel more frequently than they used to. While the two terms above may have been suitable earlier in the 20th century, reality has changed at least in the last 2 or 3 decades. In fact, only a small part of the total movement of people in and out of New Zealand is this classical “settlers” migration (Bedford, 2001). Therefore, there is an increasing need to perhaps pay greater attention to the so-called “short-term” flows in public and policy debates. For example, work permit policy may need to continue to develop a role as important as residence policy in the immigration framework. Permanent and long-term migration statistics will be less and less useful, while category jumpers will become more and more important.

4.2.2 Taking advantage of the diaspora seems like a good idea, but hard to put into practice

Some have argued that rather than focussing solely on the apparent brain drain, we should work towards a remote mobilisation of New Zealanders abroad (the diaspora) (see for example, Bedford, 2001). This strategy is essentially based on the idea benefiting from connectivity and networking.

The crucial question then is: what are the means to implement this strategy? Meyer and Brown (1999) identified 41 expatriate knowledge networks that have been identified around the world to the date of their publication. Their list only includes networks that have an explicit purpose of connecting the expatriates among themselves and with the country of origin and of promoting the exchange of skills and knowledge. These networks differ in size, scope, objectives, activities and structure, and are tied to 30 different countries, such as Ireland, France, Korea, Taiwan, and Norway. New Zealand did not have an explicit network identified by the authors⁵⁹.

However, as pointed out by Meyer and Brown (1999), it is often difficult to assess the success of these networks in terms of their contribution to the development of the source country. The types of exchanges that take place between network members and the national community – for instance, email and data exchanges, virtual chat rooms, informal advisory opinions etc. – do not always bring tangible, visible or immediate results and may not allow for a statistical assessment. However, it does not mean that these exchanges are not important. This point is illustrated clearly by Spoonley et al. (2000) with regard to networks linking Pacific peoples in several countries.

It may be that some way of harnessing the potential of New Zealanders overseas can be found. While many commentators look favourably on the possibility (Bedford et al.

⁵⁹ However, this is already changing. For example, Sheffield personnel consultants are planning a website for expatriates to contribute ideas and contacts.

(2000), and ITAG (1999)), there seems to be little in the way of concrete suggestions for what might be done or how. However, there may be something to learn from other countries that already have these kinds of policies, such as Ireland and India (see Meyer and Brown, 1999). It is worth noting that this strategy is increasingly becoming part of the public and academic debate, as can be seen from the recent *Catching the Knowledge Wave* conference in Auckland, 1-3 August 2001.

4.2.3 The trans-Tasman flows have given rise to both policy tensions and opportunities

Over the past 30 years, the net trans-Tasman flow has been almost always toward Australia from New Zealand. The large continuing imbalance has led to concerns about two particular areas where the relation between the Commonwealth and New Zealand differs from the Commonwealth's relation with the States. These two areas are the different criteria for third country migrants and the fiscal costs of social security payments (see Bushnell and Choy, 2001). They have been resolved in the case of welfare payments by redesigning the underlying policies. In the case of migration from third countries small differences in criteria have been tolerated so far.

While tensions such as those above have arisen between NZ and Australia as a result of the continuing imbalance in migration, integration has also helped open up options for better policy design. Bushnell and Choy (2001) discuss the Trans-Tasman Mutual Recognition Arrangement, which among other things, increases opportunities for New Zealanders and Australians to work in each other's country.

Furthermore, some may suggest that the new Australia-New Zealand Social Security Agreement⁶⁰ could well have some implications on the brain drain debate. We consider this issue briefly below.

For some people (those who would qualify under Australian immigration criteria), the new agreement will make no difference. For others, the new agreement would have an impact on their decision to migrate to Australia and/or the length of stay once in Australia. Therefore, the new agreement may affect the composition of workforce going over to Australia, as well as those returning to NZ. In terms of the composition affected, the dimension of relevance is not only the migrants' skill, but also their age, risk aversion, and other dimensions that influence people's migration motives and decision-making process.

4.2.4 The bottom line is to make NZ a more attractive place to work, and live

Despite the fact that there seems to be no convincing evidence of a brain drain, this does not mean that we should be complacent about our ability to continue attracting or retaining high skilled workers. We have got to respond to the increasing competition in the international labour market for high-skilled people, as a result of shortages of labour in particular occupations, and the ageing of population globally.

In terms of retaining people within New Zealand, there are very few possible controls on departures of any group. The immigration rules of other countries determine their emigration options. To the extent that departures are caused by push factors (like the

⁶⁰ For more details on the recent changes to the social security arrangements announced on 26 February 2001, see the following pdf file http://www.immi.gov.au/general/newzeal_0201.pdf or visit the website <http://www.nz-oz.gov.au/>

student loan rules), evening out enforcement across countries (tax agreements with Australia and the United Kingdom may be of value) will help reduce any distortions on departures. However, it is unclear if the student loan scheme is a big driver of departures or not. In terms of attracting high-skilled workers, there is scope for improving settlement policies and possibly the screening techniques as mentioned earlier.

Ultimately, New Zealand should focus on increasing its attractiveness (for attracting highly-skilled immigrants and return migrants, and retaining existing residents) by improving the economic position of New Zealand relative to competitor countries. In doing this, there is a role not only for government, but also for other sectors of the economy. One way is to raise productivity more generally. This way, we can afford to pay higher wages to attract the high-skilled. Another way is to encourage the use of more high-skill technologies, so that the high-skilled have opportunities here. However, these two strategies are endogenous with attracting and retaining high-skilled people. Therefore, it needs to be part of a longer term strategy. Alternatively, a more passive way would be to rely on the fact that high-skilled people might stay on in NZ on the basis of other desirable characteristics of NZ (“consumer city”) – lots of space, beautiful scenery, less pollution, etc. In this case, better marketing New Zealand might help.

5 SUMMARY AND CONCLUDING REMARKS

This paper examined the issues and evidence surrounding the brain drain debate.

Many discussions about the brain drain assume that a net outflow of people is unambiguously economically harmful for the source country, especially if those people are skilled. We question the inevitability of this received wisdom. There would be a number of reasons for concern if we were experiencing ongoing large outflows of the highly skilled. But it is not clear that a brain drain necessarily or unambiguously has an adverse effect on the economy.

The bulk of this paper examined whether there is evidence of a brain drain. The overall numbers suggest there is no brain drain, at least as popularly conceived. While there have been net outflows of permanent and long-term (PLT) migrants to the rest of the world recently, these flows are small, cyclical and follow a long period of inflows. In the longer term, New Zealand is still gaining people from migration.

We emphasised the importance of adopting a medium to longer term perspective when looking at migration flows. But if one insists on looking at the shorter term, the headline statistic (net PLT flow) gives a misleading picture. Accounting for data problems caused by category jumpers suggests that we have not been experiencing net outflows recently at all. When disaggregated by citizenship, the data supports an exchange story – the outflow of departing NZ citizens is being offset by a slightly larger inflow of non-NZ citizens.

Looking at the data by occupation reveals a much richer picture. Although those departing to the rest of the world appear to be more skilled than the remaining population, we need to take into account the large proportion of high-skilled people immigrating to New Zealand. In fact, there is some evidence that recent arrivals have contained a greater proportion of people in the high-skill category than have departures. In short, there seems to be a brain exchange, rather than a brain drain.

The data confirm that there are large and volatile net outflows from New Zealand to Australia. The limited data available on occupation seem to suggest that NZ citizens departing to Australia are not biased toward the high-skilled. Instead, they are fairly representative of the remaining population in New Zealand. This can be interpreted as evidence of a common labour market between the two countries (Bushnell and Choy, 2001).

The limited analyses in this paper on the age composition of PLT migrants suggest that the age of those departing and those arriving have both increased. More disaggregated data reveal that we have a drain of younger New Zealanders and a gain of adult non-New Zealand citizens.

The paper proceeded to consider briefly some of the impacts of these migration flows, from the population, economic and social dimensions. The size of the net impact of migration flows is small relative to other influences on population numbers, but growing over time. As for the economic impacts of migration, the only conclusion that seems to appear consistently is that settlement is an important issue for immigrants – the sooner immigrants can get jobs and start applying their valuable skills, the better – both for the incumbent population and immigrants themselves. From a social viewpoint, immigration gives diversity and colour to society, adding new perspectives, ways of

doing things, and networks. However, there are also challenges for New Zealand in coping with these changes.

In terms of policy, our work suggests that a sharper focus on selection and settlement issues is necessary, particularly on how to select immigrants who are likely to succeed, and how to assist immigrants to integrate into the labour market. These policies will be more important in the future as patterns of movement are changing - people travel more frequently than they used to and, by implication, stay less time in each place. The idea of harnessing the potential of New Zealanders overseas is worth investigating further, although concrete suggestions are not available to date. In addition, the imbalance in migration flows to Australia may give rise to bilateral tensions, although policy opportunities may be available as well. Ultimately, we should focus on making New Zealand a better place to work and live in, to attract high-skilled immigrants and return migrants, and retain existing residents.

While we conclude there is a brain exchange in broad terms, it would be worth investigating the impacts of migration flows on occupations that are in short supply, particularly those where other countries also have shortages and where New Zealand qualifications are transferable.

In the longer term, we expect competition amongst countries for skilled labour to continue to grow as a result of shortages of labour in particular occupations, shortages of young, skilled, highly-mobile professionals, and slow growth in domestic labour forces as a result of sub-replacement fertility (see Bedford et al, 2000). People will move countries more and more frequently, and thus there will continue to be scope for facilitating "short-term" flows of skilled labour, rather than focusing on the PLT flows. Countries that do not respond to global competition can expect to lose skilled workers.

Immigrants to New Zealand will increasingly come from Asia and Southern Africa, and they will increase the diversity of New Zealand's population, particularly if (as seems likely given the trends of the last 40 years) large numbers of New Zealand citizens continue to leave (Bedford et al 2000). In terms of the trans-Tasman picture, it is likely that there will continue to be net outflows to Australia - more in the years when Australia performs better economically, fewer in the trough years.

To conclude, we reiterate that there is a need to move the public debate on immigration and emigration away from reactions to short-term and volatile numbers, to a longer-term perspective, and towards a more sophisticated conception of what will be an ongoing trend – that is, the increasingly free flow of people, including New Zealanders, around the globe. We hope that this paper has provided a sound basis for that kind of debate.

REFERENCES

- Aghion, Philippe and Peter Howitt (1992), A Model of Growth through Creative Destruction, *Econometrica*, Vol. 60, Iss. 2, pp. 323-351.
- Aynsley, Maryanne (2001), *Labour Market Adjustment in Australia and New Zealand*, Research Essay, Department of Economics, University of Melbourne.
- Bedford, Richard (1987), Restructuring the arrival card: review and prospect, *New Zealand Population Review*, Vol. 13, No. 2, pp. 47-60.
- Bedford, Richard (1999), Personal correspondence with Vincent Heeringa, of *Unlimited* magazine.
- Bedford, Richard (2001), Reflections on the Spatial Odysseys of New Zealanders, *New Zealand Geographer*, Vol. 57, No. 1, pp. 37-42.
- Bedford, Richard, Elsie Ho and Jacqueline Lidgard (2000), "Immigration Policy and New Zealand's Development into the 21st Century: Review and Speculation", Paper presented to APEC-HRD-LSP Ninth International Workshop on *International Migration and Structural Change in APEC Member Economies*.
- Bedford, Richard and Jacqueline Lidgard (1997), "International Migration and the Labour Force Age Groups, 1991-1996", Briefing Paper for the *Population Conference: Communities, People and Growth*, Number 5, Population Studies Centre, University of Waikato.
- Bedford, Richard and Jeremy Lowe (1993), Migration from the 'lucky country': A perspective on former residents of Australia in New Zealand, Chapter 8 in: Carmichael, Gordon A. (ed.), *Trans-Tasman Migration: Trends, Causes and Consequences*, Canberra: Australian Government Publishing Service, pp. 255-287.
- Beine, Michel, Frédéric Docquier and Hillel Rapoport (2001), Brain drain and economic growth: theory and evidence, *Journal of Development Economics*, Vol. 64, pp. 275-289.
- BERL (1999a), "Fiscal Impacts of Migrants to New Zealand", Report prepared by Business And Economic Research Limited for the New Zealand Immigration Service.
- BERL (1999b), "Human Capital", Report prepared by Business And Economic Research Limited for the New Zealand Department of Labour.
- Bhagwati, Jagdish N. (1976) (ed.), *The Brain Drain and Taxation: Theory and Empirical Analysis*, Amsterdam: North Holland.
- Bhagwati, Jagdish N. and K. Hamada (1974), The brain drain, international integration of markets for professionals and unemployment: A theoretical analysis, *Journal of Development Economics*, Vol. 1, No. 1.
- Bhagwati, Jagdish N. and John D. Wilson (1989) (eds.), *Income Taxation and International Mobility*, Cambridge, MA: MIT Press.

Brosnan, Peter and Jacques Poot (1987a), Modelling the Determinants of Trans-Tasman migration after World War II, *Economic Record*, Vol. 63, pp. 313-329.

Brosnan, Peter and Jacques Poot (1987b), Economic and Demographic Aspects of Trans-Tasman Population Exchange, *New Zealand Population Review*, November, pp. 4-16.

Bushnell, Peter and Wai Kin Choy (2001), "Go West, Young Man, Go West!?", *Treasury Working Paper 01/07*, New Zealand Treasury, (see <http://www.treasury.govt.nz/workingpapers/>) (This paper was presented at the seminar "Strategic Responses to Integration Pressures: Lessons from Around the World", Harvard University, 29-30 March 2001).

Carmichael, Gordon A. (1993a) (ed.), *Trans-Tasman Migration: Trends, Causes and Consequences*, Australian Government Publishing Service, Canberra.

Carmichael, Gordon A. (1993b), History of trans-Tasman population movement. In: Carmichael, Gordon A. (1993a) (ed.), *Trans-Tasman Migration: Trends, Causes and Consequences*, Australian Government Publishing Service, Canberra, pp. 29-63.

Carmichael, Gordon A. (1993c), Trans-Tasman population movement in the 1980s: Insights from Australian data. In: Carmichael, Gordon A. (1993a) (ed.), *Trans-Tasman Migration: Trends, Causes and Consequences*, Australian Government Publishing Service, Canberra, pp. 64-124.

Carmichael, Gordon A. (1993d), Beware the Passenger Card! Australian and New Zealand Data on Population Movement Between the Two Countries, *International Migration Review*, Vol. 27, No. 1, pp. 819-849.

Carmichael, Gordon A., Stephen Buetow and Ruth Farmer (1993), Policy and data. In: Carmichael, Gordon A. (1993a) (ed.), *Trans-Tasman Migration: Trends, Causes and Consequences*, Australian Government Publishing Service, Canberra, pp. 5-28.

Carrington, William J. and Enrica Detragiache (1998), How Big is the Brain Drain?, *IMF Working Paper*, WP/98/102, July, (see <http://www.imf.org/>)

Claridge, Megan and Sarah Box (2000), "Economic Integration, Sovereignty and Identity: New Zealand in the Global Economy", *Treasury Working Paper 00/22*, New Zealand Treasury, (see <http://www.treasury.govt.nz/workingpapers/>)

DeVoretz, Don and Samuel A. Laryea (1998), "Canadian Human Capital Transfers: The United States and Beyond", *C. D. Howe Institute Commentary 115*, Toronto: C. D. Howe Institute, (see <http://www.cdhowe.org/pdf/devoretz.pdf>)

Farmer, Ruth and Stephen Buetow (1993), Aspects of trans-Tasman migration in the 1980s: Insights from New Zealand data. In: Carmichael, Gordon A. (1993a) (ed.), *Trans-Tasman Migration: Trends, Causes and Consequences*, Australian Government Publishing Service, Canberra, pp. 125-182.

Glass, Hayden (2001), "The Brain Drain: Some Evidence", New Zealand Treasury, Unpublished Internal Note.

Golden, Claudia and Lawrence F. Katz (1998), The Origins of Technology-Skill Complementarity, *Quarterly Journal of Economics*, Vol. 108, pp. 693-732.

Hague, Nadeem U. and Se-Jik Kim (1995), "Human Capital Flight": Impact of Migration on Income and Growth, *IMF Staff Papers*, Vol. 42, No. 3, pp. 577-607.

Hamermesh, Daniel (1993), *Labor Demand*, Princeton, NJ: Princeton University Press.

Humphris, Janet (2001), "Descriptive analysis of emigration patterns of New Zealand citizens, using data from New Zealand arrival and departure cards", Labour Market Policy Group, New Zealand Department of Labour, Unpublished Paper, March.

ITAG (Information Technology Advisory Group to the Minister of Information Technology) (1999), "The Knowledge Economy", Submission to the New Zealand Government.

Johnson, Jean M. and Mark C. Regets (1998), International Mobility of Scientists and Engineers to the United States – Brain Drain or Brain Circulation?, National Science Foundation, Directorate for Social, Behavioral and Economic Sciences, NSF 98-316, November 10. (see www.nsf.gov/sbe/srs/issuebrf/sib98316.htm)

Krusell, Per, Lee E. Ohanian, José-Víctor Ríos-Rull, and Giovanni L. Violante (1997), "Capital-Skill Complementarity and Inequality: A Macroeconomic Analysis", *Research Department Staff Report 239*, Federal Reserve Bank of Minneapolis.

Lidgard, Jacqueline (1993), Neglected International Migrants: A Study of Returning New Zealanders, *New Zealand Population Review*, Vol. 19, pp. 94-124.

Lidgard, Jacqueline (1994), Return Migration of New Zealanders: A Profile of 1990 Returnees, *New Zealand Journal of Geography*, April, pp. 3-13.

Lidgard, Jacqueline and Richard Bedford (1999), New Zealand's International Migration System at the End of the 20th Century: Review and Prospect, *New Zealand Population Review*, Vol. 25, pp. 41-56.

Lidgard, Jacqueline, Richard Bedford and Joanne Goodwin (1998), "International Migration from Northeast Asia and Population Change in New Zealand, 1986 to 1996", *PSC Discussion Paper No. 26*, Population Studies Centre, University of Waikato.

Maré, David C. and Wai Kin Choy (2001), "Regional Labour Market Adjustment and the Movements of People: A Review Paper", *Treasury Working Paper 01/08*, New Zealand Treasury, (see <http://www.treasury.govt.nz/workingpapers/>)

McNicoll, Geoffrey (1993), The economics of Australian immigration, with reference to trans-Tasman flows. In: Carmichael, Gordon A. (1993a) (ed.), *Trans-Tasman Migration: Trends, Causes and Consequences*, Australian Government Publishing Service, Canberra, pp. 315-326.

Meyer, Jean-Baptiste and Mercy Brown (1999), "Scientific Diasporas: A New Approach to the Brain Drain", Paper prepared for the *World Conference on Science*, UNESCO-ICSU, Budapest, Hungary, 26 June-1 July, (see <http://www.unesco.org/most/meyer.htm>)

Mountford, Andrew (1997), Can a brain drain be good for growth in the source economy?, *Journal of Development Economics*, Vol. 53, pp. 287-303.

Nana, Ganesh and Jacques Poot (1996), *Trans-Tasman Migration and Closer Economic Relations*, In: Lloyd, P.J. and P.S.Williams (eds.), International Trade and Migration in the APEC Region, Oxford University Press.

NZIER (1994), "Literature Review on the Economic Impact of Immigration", Report to New Zealand Department of Labour, New Zealand Institute of Economic Research, Working Paper 95/5.

NZIER (1996), "A Framework for the Assessment of the Economic and Social Effects of Immigration", Report to the New Zealand Department of Labour, New Zealand Institute of Economic Research.

NZIER (1998), "Economic Impacts of Immigration", Draft report for the New Zealand Department of Labour, New Zealand Institute of Economic Research, October 1998.

Pomp, Richard D. (1989), The Experience of the Philippines in Taxing its Nonresident Citizens. In: Bhagwati, Jagdish N. and John D. Wilson (eds.), *Income Taxation and International Mobility*, Cambridge, MA: MIT Press, pp. 43-81.

Pool, Ian (1980), *Trans-Tasman Migration*, A Report for the Australia-New Zealand Foundation, Population Studies Centre, University of Waikato, February.

Poot, Jacques (1993), Trans-Tasman migration and economic growth in Australasia, Chapter 9 in: Carmichael, Gordon A. (ed.), *Trans-Tasman Migration: Trends, Causes and Consequences*, Canberra: Australian Government Publishing Service, pp.288-314.

Poot, Jacques (1995), Do Borders Matter? A Model of Interregional Migration in Australasia, *Australasian Journal of Regional Studies*, Vol. 1, pp. 159-182.

Poot, Jacques (1998), "Immigration and the Population Conference", *Victoria Economic Commentaries*, March 1998, Victoria University of Wellington.

Poot, Jacques, Ganesh Nana and Bryan Philpott (1988), *International Migration and the New Zealand Economy: A Long-run Perspective*, Institute of Policy Studies, Victoria University of Wellington.

Reich, Robert (1992), *The Work on Nations*, New York: Simon and Shuster.

Rodrik, D (1997), *Has globalisation gone too far?*, Institute for International Economics, Washington DC.

Rodrik, D. (1999), Where did all the growth go? External shocks, social conflicts and growth collapses, *Journal of Economic Growth*, Vol. 4, pp. 385-412.

Rodrik, D. (2000), "Social cohesion, public policy and economic growth: implications for OECD countries", Keynote address prepared for an international symposium on *The contribution of human and social capital to sustained economic growth and well-being*, organised by Human Resources Development Canada and the Organisation for Economic Co-operation and Development, Quebec City, 19-21 March.

Shevland, Marita (1999), "Recent External Migration Flows of Skilled New Zealand Workers", Unpublished Report, Ministry of Education.

Smith, T. Fred (1997), Engineering Brain-Gain Revisited, *People and Place*, Vol. 5, No. 4. (see <http://elecpress.monash.edu.au/pnp/pnpv5n4/smith.htm>)

Spoonley, Paul, Richard Bedford and Cluny Macpherson (2000), "Divided loyalties and fractured sovereignty: transnationalism and the State in Aotearoa/New Zealand", Paper presented at the workshop "The Role of the State in the Transnational Moment", Fifth International Metropolis Conference, Vancouver, 13-17 November.

Stark, Oded, Christian Helmenstein and Alexia Prskawetz (1997), A brain gain with a brain drain, *Economics Letters*, Vol. 55, pp. 227-234.

Treasury (1999), *Towards Higher Living Standards for New Zealanders*, Briefing to the Incoming Government (see <http://www.treasury.govt.nz/briefings/1999/big99-hl-1.pdf>).

Trlin, Andrew and Spoonley, Paul (1980), Goodbye New Zealand! Net External Migration Losses in the 1960s and 1970s. In: Price, C. A. (ed.) *Australian Immigration: A Bibliography and Digest*, Australian National University, Canberra.

Winkelmann, Liliana and Rainer Winkelmann (1998a), "Immigrants in New Zealand: A Study of their Labour Market Outcomes", *Occasional Paper 1998/1* for the Labour Market Policy Group, Department of Labour, Wellington.

Winkelmann, Rainer (2000), "Immigration Policies and their Impact: The Case of New Zealand and Australia", *IZA Discussion Paper No. 169*, July.