Globalisation, gendered migration and labour markets*

Working paper

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Abstract

In New Zealand, in all age groups under 20, and in key working age groups, historically there have been more men than women. However, census data indicate that the number of New Zealand women residents relative to men in the broad 20-49 age group has been increasing since the 1980s.

Given that birth ratios for New Zealand residents favour boys in common with international experience, the imbalance of women over men in the 20-49 age group has to come from four possible sources: 1) differential mortality, 2) more New Zealand born men leaving New Zealand, 3) a higher number of female immigrants, or 4) that statistical collections are undercounting men, and this undercounting has become progressively greater over the past 20 years.

The study indicated that differences in mortality between males and females at ages between 20 and 49 years makes a small contribution to the numerical imbalance between the sexes, that over recent decades migration both in and out of New Zealand plays an important but quite complex role, and that undercount may be more important that previously considered. This exploratory study cannot determine the relative weight of each factor. To achieve this would require more detailed modelling work.

In theory, a shortage of males in key couple forming age groups may lead to more women not having a (male) partner and relatively fewer unpartnered men, which may reduce fertility, and may lead to an increase in female employment. New Zealand data show that over the long term more women are either living on their own or are sole parents, female employment has increased and fertility has declined. However, this trend is evident in all countries, regardless of the prevailing sex ratios.

While unlikely to be a key driver of behaviour, the recent changes in sex ratios, in absolute terms but more importantly educationally, are likely to support some continued growth in female employment and women living on their own. They are also likely to make it more difficult to support fertility rates at, or above, replacement rates. In addition, given the greater propensity for women to marry ‘down’ educationally, women’s increased bargaining power within couple households over issues such as childcare may mean that negotiating work-life arrangements with their employers becomes more important for men in the future.

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Table of contents

Introduction

In New Zealand, in all age groups under 20, historically there have been more men than women. This reflects a naturally occurring ratio by which the number of boys born is higher relative to girls. Aside from WW1 and II, since official data was collected through to the 1980s there have been more men than women in the prime working and couple forming age groups (20-49). However, since the early 1980s among prime working-age groups this ratio has reversed, with an apparent imbalance between the numbers of women and men. New Zealand also appears to stand out amongst industrialised countries in terms of the size and direction of this imbalance (see Appendix 1). While the changes in New Zealand sex ratios had been noted by demographers, no attention had been given to the reasons why they had been changing.

This exploratory study is funded by the Department of Labour's Future of Work Contestable Fund and has three main objectives.[1] These are:

- Why, since the early 1980s, has there been an increasing number of women, particularly well-educated women, relative to men within prime-working age groups in New Zealand?
- Are differences in opportunities in global labour markets influencing the gender and educational composition of migration flows in and out of New Zealand, or are there other reasons for the imbalance?
- What, if any, are the labour market implications of an imbalance between women and men.

A fourth subsidiary objective is to explore the possible implications of changes in sex ratios on couple formation and on fertility. Underlying this objective is an assumption that changes in household type and in fertility may ultimately have an effect on labour markets.[2]

The paper is in three parts. First, the paper sets out trends in sex ratios in the 20-49 age group. The ratios used are the number of women relative to men.[3] Both national and regional baseline data are presented. These data are drawn from the five yearly Census of Population and Dwellings and the yearly Population Estimates produced by Statistics New Zealand. The reasons for differences between these two data sources are explored. Next, the effect of differential mortality on sex ratios is considered briefly. This has not been considered to be a major reason for the sex ratio changes. Rather, it is hypothesised that gendered migration is the key reason behind the changes in sex ratios. This hypothesis is explored by drawing on a range of data, including student loan data.

[1] Following announcement of the project, the media have taken a close interest in the topic. Hence, this paper refers to a number of newspaper articles either based around some early findings of the project or in reaction to comments on changing sex ratios by Bernard Salt of KPMG in Australia.

[2] A separate background paper has been prepared summarising a selection of both theoretical and empirical research on possible relationships between sex ratio imbalances, couple formation, fertility and labour force participation (Callister 2006).

[3] This is in contrast to many sex ratio studies that use the ratio of men to women.

The second part of the paper examines the possible effect of changing sex ratios on New Zealand's 'marriage market', employment and fertility. Included in this section is an exploration as to whether changing marriage markets may themselves have contributed to changes in sex ratios.

In part three of the paper, we briefly examine recent Statistics New Zealand population projections. We then consider some possible overall implications of changing sex ratios on New Zealand's labour market. We conclude by putting forward some ideas for further research.

Key findings

Changing sex ratios

In New Zealand, in all age groups under 20, and in key working age groups, historically there have been more men than women. However, census data indicate that the number of New Zealand women residents relative to men in the broad 20-49 age group has been increasing since the 1980s.

The ratio of young women to men appears to be particularly high when tertiary education qualifications are considered. For example, in 2001 in the 25-30 age group there were over a third more women than men with a degree or higher qualification.

However, it is known that census data undercount some segments of the population. In particular young men are undercounted. Population estimates, produced by Statistics New Zealand, adjust for estimated undercounts and those New Zealanders temporarily overseas. These estimates turn a surplus of women in the 20-24 age group into a surplus of men. They also marginally reduce the surplus of women in the broad 25-49 age group.

Using 2001 census data, there were just over 53,000 more women than men in the 20-49 age group. Population estimates for 2005 suggest this figure to be more in the order of 35,000 extra women. The largest imbalance in 2005 was in the 30-34 age group with, based on population estimates, an estimated 9 percent more women than men.

We expected the ratios of women to men to be relatively high in major New Zealand cities, but not in rural areas. Yet, census data indicate that there are more women than men in most of the prime couple forming age groups throughout New Zealand.

While the imbalance between men and women is strong in all main ethnic groups, in 2001 it is amongst Asians where the differences are the greatest. Amongst Maori the differences are also greater than amongst Europeans. However, undercounts may be particularly problematic for young Maori and Pacific men, since it is among Maori and Pacific males in these age groups that both failure to be enumerated and non-response to the ethnicity question in the census are known to be highest. They may also be more of a problem for young Asians, especially those in New Zealand studying at the time of a

census. However, in this case, one would expect that both women and men would be undercounted.

While there are problems in comparing ethnicity data over time, across all ethnic groups the sex ratios were lower in 1991. However, the greatest change was in the Asian group, both in terms of numbers and the ratios. This suggests gendered migration flows in this group in the decade between 1991 and 2001, together with other potential explanations such as differential underenumeration, differing sex ratios among the locally born population and ethnic mobility.

Based on UN comparative data, New Zealand appears to stand out amongst industrialised countries in terms of sex ratios in prime couple forming and childbearing age groups, although not overall. It is noteworthy that the United Nations only publishes figures for broad age groups because of data quality issues.

Why have sex ratios changed?

Given that birth ratios for New Zealand residents favour boys in common with international experience, the imbalance of women over men in the 20-49 age group has to come from four possible sources: 1) differential mortality, 2) more New Zealand born men leaving New Zealand, 3) a higher number of female immigrants, or 4) that statistical collections are undercounting men, and this undercounting has become progressively greater over the past 20 years.

This small exploratory study cannot exactly determine the relative weight of each factor. This requires more detailed modelling work. However, the study can determine which factors are of some importance. When beginning this project we expected migration to be the key factor in the increasing imbalance.

Life tables indicate that changes in patterns of mortality cannot be completely discounted in explanations for the increasing surplus of women over men in the age group 20-49 years. Differential mortality has been contributing in a small way to the growing disparity in numbers of males and females enumerated in the resident population between the early 1980s and the early 2000s.

The role of migration is more complex. In terms of outward migration, given that Australia is the main country of residence for expatriate New Zealanders, we expected to see evidence of there being more New Zealand men than women in Australia (the mirror image of New Zealand sex ratios). However, the data on the New Zealand-born population living in Australia at the time of the 2001 census there do not show this. Nor do data from the 2001 UK census.

We also initially assumed that most of the changes brought about by migration would be due to New Zealand citizens leaving and potentially not coming back to New Zealand (or, at least, staying outside New Zealand for a long period, perhaps with men and women

having different patterns of travel). However, while the movement of New Zealand citizens appears to be very important, the actual flows are complex. There is evidence of two contradictory trends contributing to the widening gap in numbers of males and females aged between 20 and 49 years. In the early 1990s a small surplus of women in the overall net gains between 1991 and 1996 augmented a little the growing female surplus in the resident population. In the late 1990s, net losses rather than net gains were found for the population aged 20-49 years, and a significantly greater net loss of males contributed to the growing male deficit in the resident population.

These findings reinforce arguments for always examining the gross flows of New Zealand citizens (including analysis by birthplace), as well as those of immigrants, when examining the impact of international migration on New Zealand's resident population. The complex interplay of flows in the citizen and non-citizen populations means that there is rarely a simple "migration" answer to any population-related question, and considering only net flows disguises the complexity of the flows. As is shown in the section examining the arrival and departure data, separate analysis of the flows into and out of the country, rather than just the net balance in these flows, assists in identifying the age groups, by gender, that are impacted most by international migration. The net flows disguise large variations in the absolute numbers of people entering and leaving the country. This is especially important when looking at the contributions made by migrants from different source regions.

While both the migration and census data indicate that sex ratios are the highest amongst the Asian group, Asians are still a relatively small part of the overall New Zealand population. Therefore, while over recent decades the inflow of Asian women in excess of Asian men is an important new trend, the reasons for changes in overall sex ratios in New Zealand need to primarily consider what is taking place with the much larger European group, as well as within Maori, Pacific Peoples and the group 'Other". It is incorrect to characterise these inflows of Asian women as "women flocking" to New Zealand.

It is difficult to find simple explanations as to what is driving 'gendered' migration flows. Historically migrant flows to countries such as New Zealand, Australia, the US and Canada have been male dominated, so immigrant communities have often been characterized by uneven sex ratios. A change from predominantly male flows to seeing larger international flows of women reflects, amongst other things, changes in industrial demand. For example in some high income countries there is increasing demand for service workers, including low skill care workers.

More subtle factors may also be influencing gendered migration. For example, "satellite" Asian families in New Zealand, where the male returns to work in Asia will result in "missing men". In addition, it has been suggested that New Zealand men returning from overseas may be more likely to bring in an overseas partner, or that some New Zealand men are bringing in 'brides' from Asia. However, while there is evidence that non-Asian New Zealand men are far more likely to have an Asian partner than non-Asian New Zealand women, overall the available data do not support the theory that men returning

with overseas born partners are contributing to the shortage of men (or surplus of females) in New Zealand.

As already noted, in New Zealand sex ratios are particularly uneven amongst those with tertiary qualifications. Much of this reflects unequal growth in participation in tertiary education, with women greatly outnumbering men in all age groups. However, migration may also be exacerbating this trend. Previous New Zealand research, as well as international studies, suggests it is the 'best and brightest' who tend to migrate. But we also know that there is a 'brain swap' rather than a 'brain drain' taking place in New Zealand. Census data indicate that the ratio of well-educated women to men is more extreme amongst those New Zealand residents born overseas than for those born in New Zealand. This may indicate that there is some gender component to this 'swap' as well; we may, to some degree, be 'swapping' well-educated New Zealand males for well-educated female immigrants.

While much caution is needed when using student loan data, these data indicate that in the 30-39 age group, even though the total number of women with student loans greatly outnumbers men, there were more men with loans overseas in 2001. Higher wages overseas, perhaps at times combined with high levels of student debt, is likely to be drawing well-educated New Zealanders out of New Zealand. The student loan data suggest there may be some gender dimension to this outflow. To better understand this we would ideally need data on the qualification levels of those leaving New Zealand and some idea of the jobs they are moving into overseas. However, the loan data also show that most people with student loans are living in New Zealand in all age groups.

Sex ratios, family formation, fertility and employment

In theory, a shortage of males in key couple forming age groups may lead to more women not having a (male) partner and relatively fewer unpartnered men, which may reduce fertility, and may lead to an increase in female employment. New Zealand data show that over the long term more women are either living on their own, or are sole parents. In addition, New Zealand is at the high end of the OECD with regards to the proportion of mothers who do not have a partner living with them. Employment rates for women in prime couple forming and childbearing age groups, while below those of many OECD countries, are nevertheless also historically high. In parallel, fertility rates, while higher than most other industrialised countries, are well down on those rates seen in the 1970s.

While theory might suggest some linkages between sex ratios, marriage rates, employment of women and fertility, both New Zealand and international data show that there are many other factors influencing decisions in all these important areas of life. Other changes taking place in society, such as increases in women's educational levels and declining employment rates for men, mean that changes in absolute sex ratios are unlikely to have contributed greatly to behavioural change.

But the changes in educational ratios, and connected with this, changes in the number of women relative to men employed full time, do seem to be having some impact on

behaviour. As an example, census data show that New Zealand women are increasingly ‘marrying down’ educationally, contrasting with the historically wider acceptance of males 'marrying down'. In 1986, 61% of partnered women aged 25-34 with a degree or higher education qualification had a partner with a similar qualification. But by 2001 this had declined to 52%.

Census data indicate the women most likely to face difficulties in obtaining an opposite sex partner, or remaining in a long term relationship with them, are those with low levels of education. These women face difficulties in both the labour market and marriage market. Yet, overall relatively few New Zealand women in all educational groups in their late 30s are either not partnered or, if not partnered, do not have a child. Changes in education and employment for well-educated women, as well as the provision of income support from the state, alongside changes in social norms mean that women in New Zealand can have a child without a partner.

While unlikely to be a key driver of behaviour, the changes in sex ratios, both in absolute terms and, more importantly, educationally, are likely to support some continued growth in female employment. They are also likely to make it more difficult to support fertility rates at, or above, replacement rates. In addition, given the greater propensity for women to marry ‘down’, women’s increased bargaining power within couple households over issues such as childcare may mean that negotiating work-life arrangements with their employers becomes more important for men in the future.

Looking ahead

Will the ratios change in the future? Recent Statistics New Zealand population projections assume a very rapid reversal of the long-term historical trend in sex ratios. While it may be that sex ratios in these age groups do eventually revert to levels last seen in the 1960s, a greater understanding of the causes of the changes in sex ratios is needed in order to have confidence in these projections.

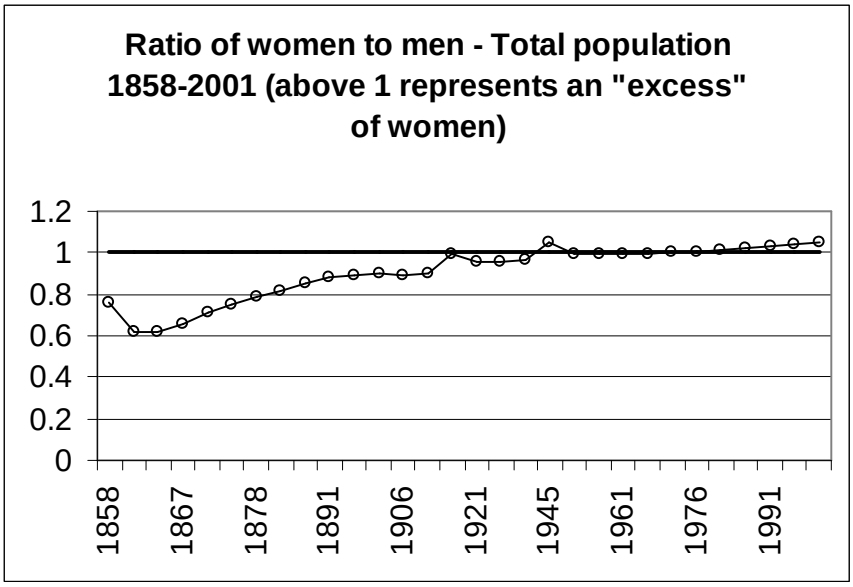
Given that this is a small-scale exploratory study the findings in many areas are still tentative. More research is needed if we are to fully understand what has been driving the changes in sex ratios in New Zealand. Key questions that remain unresolved include: how much of the sex imbalance is real and how much is due to problems with data collection; are there gender imbalances amongst New Zealand born living in countries other than Australia and the UK; have New Zealand migration policies contributed to the imbalances in New Zealand; and how might the globalisation of labour markets, and the changing structure of the New Zealand economy, be contributing to gendered migration flows. While some of this research can be undertaken using existing datasets, including utilising 2006 census data once it becomes available, new data may be needed.

Part 1: Changes in sex ratios

Introduction

Apart from brief periods in WW1, the 1918 influenza pandemic (Rice, 2005) and WW2, from the time of European colonisation through to 1968 there have been more men than women in the total New Zealand population. However, since 1968 there have, at each census, been more women recorded than men living in New Zealand. In 2001, according to the census, there were 5% more women than men (Figure 1).

Figure 1.



Source: Robert Didham, based on Statistics New Zealand Census data (excluding Maori censuses)

In part, this overall change in sex ratios reflects an ageing of the population. In industrialised countries gender mortality differences result in a greater number of older women than older men. When a longer-term perspective is taken, the change in the sex ratio also reflects a stage of social and economic development, and gender empowerment. In poor countries higher rates of maternal mortality and fewer resources going to women often results in more men than women in the population (Sen 1998). In a number of developing countries, notably China and India, the number of infant boys relative to girls has in recent decades been far higher than naturally occurring patterns in sex ratios at birth. This primarily reflects sex selection choices made by parents, though data collection issues appear to be highly significant[4].

[4] Interestingly, in China recently concern was raised (Goodkind, 2004) about "missing" children that indicates that some of the issues considered in this paper have wider significance for demographers. In this case, sex bias was a lesser problem than the numbers of both sexes missing from official data collections.

While ageing of the population has affected sex ratios, census data for prime working and childbearing age groups since the early 1980s suggest that the ratio of men to women in New Zealand has reversed (Table 1). Census data shows that in 1986 there were just over 700 more men than women in the 20-49 age group. This reversed in the 1991 census, with 13,000 more women than men. This excess of women rose to over 35,000 in 1996 and to just over 53,000 in 2001.[5]

Table 1: Ratio of women to men in the 20-49 age groups, 1966-2001

	1966	1971	1976	1981	1986	1991	1996	2001
20-24	0.96	0.97	0.97	0.96	0.98	0.99	1.02	1.02
25-29	0.97	0.98	0.98	1.01	1.01	1.05	1.06	1.09
30-34	0.95	0.98	0.98	1.00	1.02	1.04	1.06	1.11
35-39	0.93	0.96	0.97	1.00	1.00	1.02	1.05	1.08
40-44	0.97	0.94	0.96	0.99	0.99	1.01	1.03	1.06
45-49	1.02	0.97	0.94	0.96	0.99	0.99	1.01	1.04
20-49	0.96	0.97	0.97	0.99	1.00	1.02	1.04	1.07

Source: Robert Didham, based on Statistics New Zealand Census data

Yet, there are some problems with census data. In a study focusing primarily on South African sex ratios, Phillips et al (2003) note that in virtually every country in the world which collect data by census, implausibly high ratios of women to men can be found in the younger working ages. They suggest that geographically mobile young men of those ages are undercounted relative to women of the same age. The authors note that, like all national census offices, South Africa needs to seek ways to reduce the undercount of mobile young adults, especially mobile young men.

Statistics New Zealand carries out its own post census study of census response rates. The 2001 Post-enumeration Survey indicated that:

- The 2001 Census is likely to have missed more men than women. The undercount rate was estimated at 2.6 percent for males and 1.9 percent for females.
- People aged 15–29 years – the most mobile segment of the population – had the highest undercount (3.1 percent), while those aged 45 years and over had the lowest (1.4 percent).
- Potentially connected with their older age structure, the majority European ethnic group was better enumerated than either the Māori or Pacific peoples.

The estimated resident populations (ERP) from 2001 onwards are obtained by updating the census usually resident population count at the 2001 Census (held in March) for

[5] To put these figures into a long-term perspective, census data for 1921 and 1926 and population estimates for 2004 in the key age groups that couple formation is at its strongest show that the sex ratios post the loss of young men in WW1 are similar to the sex ratios now seen in 2004. For example, in the 25-29 age group the ratio in 1921 was 1.10, in 1926 1.00 and 2004 1.03. For the 30-34 age group the figures are 1.01, 1.09 and 1.09.

births, deaths and net migration of residents during the period March 2001 to the date of the estimate. The base population is also adjusted for the number of residents estimated to be undercounted by the census, as measured by the 2001 Post-enumeration Survey, and for the estimated number of New Zealand residents temporarily overseas. It is possible that these estimates are still undercounting men. Table 2 also uses December, and then June estimates whereas the census is undertaken in March.

Table 2 shows the sex ratios for the estimated population between 1991 and 2001 as well as 2004 and 2005 data. The way that ratios have changed over time suggests that there might be some cohort effect as an imbalance moves through age groups. For example, in 1999 in the 30-34 age group the ratio was 1.08, the same ratio as in the 35-39 age group five years later.

Table 2: Estimated population sex ratios - total New Zealand population - as at 31 December 1991-2004 and June 2005

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2004	2005*
20-24	1.02	1.01	1.01	1.01	1.01	1.00	0.99	0.99	0.98	0.96	0.95	0.96	0.96
25-29	1.04	1.04	1.04	1.05	1.05	1.06	1.06	1.06	1.06	1.06	1.04	1.04	1.03
30-34	1.04	1.04	1.05	1.05	1.05	1.05	1.06	1.07	1.08	1.09	1.09	1.09	1.09
35-39	1.03	1.03	1.03	1.03	1.03	1.04	1.05	1.05	1.06	1.06	1.06	1.07	1.08
40-44	1.01	1.01	1.01	1.02	1.02	1.02	1.03	1.03	1.03	1.04	1.05	1.06	1.06
45-49	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.01	1.02	1.02	1.02	1.03	1.03
20-49	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.04	1.04	1.04	1.04	1.04	1.04

Source: Estimated Resident Population data, Statistics New Zealand
* provisional

Table 3 compares census sex ratios and estimated resident population ratios for 2001.

Table 3: Comparisons of sex ratios using census data and estimated resident population data, 2001

	Ratio of women to men		"Excess" of women	
	Census	ERP June 2001	Census	ERP June 2001
20-24	1.02	1.00	2,199	190
25-29	1.09	1.07	10,884	8,610
30-34	1.11	1.09	14,886	11,990
35-39	1.08	1.06	12,105	9,460
40-44	1.06	1.04	8,616	6,270
45-49	1.04	1.03	4,728	3,330
Total	1.07	1.04	53,418	30,250

Source: Census and Estimated Resident Population data, Statistics New Zealand

These data suggest that when considering a more detailed analysis of sex ratios using 2001 census data, caution should be used when considering the results for the 20-24 age group and, to a lesser degree, the 25-29 age group.

Australian Bernard Salt (2005) used 2004 Population Estimates to comment on what he termed as the 'man drought' in New Zealand. In his report he noted "A 32-year old Kiwi woman in 2004 had as much chance of finding a male partner her own age as did an 82-year old woman." In the New Zealand media this became statements such as (Davis 2005):

"New Zealand's eligible 30-something bachelorettes may need to resort to internet dating, migrating to Stewart Island or taking a toy-boy, after another study confirms the lack of Kiwi men in their age group."

"The report calculated that a heterosexual woman aged 33 in New Zealand had as much chance of finding a male partner of her own age as did a woman aged 85."

"The toy-boy solution. What's so good about men in their 30s, anyway? The consensus is that while women reach their sexual peak at 35, men are at their best at 18."

The population estimates do not support some of these statements. For example, while there were about 9 percent more women than men in the mid 30 age group in 2004, there were about 60 percent more women than men in the 82 age group (and 90 percent more in the 85 age group). In their enthusiasm for a good story, fact became fiction.

Overall, using the estimated resident population figures, there were in total 3% more women in New Zealand in 2001, two percentage points lower than the 5% suggested by the census. In 2004 the estimated figure stayed at 3% more women than men. This is a total of just over 65,000 more women than men in New Zealand, made of up 31,000 more men than women under the age of 20, and nearly 97,000 more women than men aged 20 and older.

A more detailed analysis of sex ratios using 2001 census data

In this section we examine, briefly, three variables that might have some impact on the gender imbalances in the population aged 20-49 years: ethnicity, residential location, and education attainment. With regard to ethnicity, it can be noted that while the imbalance between men and women is strong in all main ethnic groups, in 2001 it is amongst Asians where the differences are the greatest (Table 4). As will be explored later in the paper, differences in patterns of migration contribute to this. Amongst Maori the differences are also greater than amongst Europeans. However, undercounts may be particularly problematic for young Maori and Pacific men.

Table 4: Ratio of women to men in each age and ethnic group, total ethnic counts, 2001

	European		Maori		Pacific		Asian	
20-24	167,379	1.03	42,096	1.09	19,782	1.08	24,018	1.05
25-29	180,117	1.10	40,161	1.16	17,979	1.09	17,979	1.25
30-34	206,805	1.11	39,252	1.16	17,778	1.14	19,950	1.37
35-39	222,825	1.09	38,322	1.13	16,011	1.10	22,725	1.23
40-44	220,077	1.05	32,856	1.12	12,753	1.08	19,803	1.26
45-49	198,456	1.03	25,092	1.07	10,131	1.00	15,693	1.21
Total	1,195,659	1.07	217,779	1.13	94,434	1.09	120,168	1.22

Source: Census, Statistics New Zealand

As a comparison, Table 5 shows the ethnic ratios in 1991. While there are problems in comparing ethnicity data over time, the table suggests that across all ethnic groups the ratios were lower in 1991. The greatest change between 1991 and 2001 is in the Asian group, both in terms of numbers and the ratios. This suggests gendered migration flows in this group during the 1990s, though there is a very high level of diversity within ethnic groups that often exceeds the differences between groups.

Table 5: Ratio of women to men in each age and ethnic group, total ethnic counts, 1991

	European		Maori		Pacific		Asian	
20-24	211,998	0.98	42,855	1.06	16,692	1.14	9,336	1.09
25-29	212,346	1.04	39,561	1.11	15,627	1.17	11,847	1.05
30-34	218,754	1.03	33,999	1.12	13,080	1.09	11,589	1.06
35-39	203,832	1.03	26,010	1.07	10,788	1.01	9,420	1.04
40-44	202,941	1.01	20,745	1.05	8,547	0.99	7,131	1.04
45-49	162,069	1.00	15,441	1.04	5,997	1.00	4,311	0.93
Total	1,211,940	1.01	178,611	1.08	70,731	1.09	53,634	1.05

Source: Census, Statistics New Zealand

Although based on birthplace rather than ethnicity and not age specific, some Australian census data for 2001 also suggest that the strongest imbalance between women and men has been amongst the wider Asian group, but particularly from areas in South-East Asia. Comparative New Zealand data indicates a similar pattern (Table 6).

Table 6: Sex ratios of major birthplace groups in Australia and New Zealand, 2001

Major birthplace groups	Australia	New Zealand
Oceania (including Australia and New Zealand)	1.03	1.05
North West Europe	0.96	1.00
Southern and Eastern Europe	0.96	1.00
North Africa and Middle East	0.90	0.81
South-East Asia	1.23	1.32
North-East Asia	1.16	1.17
Southern and Central Asia	0.84	0.92
Americas	1.07	1.09
Sub-Saharan Africa	1.00	1.04

Source: Census, Statistics New Zealand and Australian Bureau of Statistics

It might be expected that the sex imbalance would be more pronounced in highly urbanised areas with potentially a higher number of men in rural communities due to the types of jobs available in those areas. This idea is supported by US literature that suggests that women outnumber men in some large urban areas, due primarily to internal migration for work and study. For example, Angrist (2001) notes that the US 1990 census shows that Washington DC and New York City had considerably more women than men in the 18-25 age group. Table 7, based on regional data for New Zealand, does not sustain the idea that it is predominantly regions with large urban areas where women outnumber men.

Table 7: Ratio of women to men by region, 2001

Area	20-24	25-29	30-34	35-39	40-44	45-49
Northland Region	1.07	1.10	1.18	1.15	1.08	1.03
Auckland Region	1.04	1.11	1.12	1.07	1.08	1.06
Waikato Region	0.99	1.05	1.11	1.08	1.05	1.03
Bay of Plenty Region	1.07	1.14	1.16	1.13	1.09	1.07
Gisborne Region	1.07	1.07	1.17	1.21	1.00	0.96
Hawke's Bay Region	0.97	1.10	1.08	1.12	1.06	1.08
Taranaki Region	0.99	1.10	1.08	1.07	1.09	0.97
Manawatu-Wanganui Region	0.99	1.06	1.11	1.09	1.05	1.04
Wellington Region	1.08	1.11	1.10	1.08	1.05	1.04
Tasman Region	0.93	1.05	1.01	1.05	1.08	0.97
Nelson Region	1.00	1.02	1.06	1.05	1.08	1.05
Marlborough Region	0.90	0.93	1.04	1.09	0.98	0.97
West Coast Region	1.04	1.08	1.07	0.98	0.91	0.89
Canterbury Region	1.00	1.09	1.07	1.07	1.04	1.03
Otago Region	1.08	1.08	1.12	1.06	1.04	0.99
Southland Region	0.94	1.05	1.07	1.02	1.00	0.94
New Zealand	1.02	1.09	1.11	1.08	1.06	1.04

Source: Census, Statistics New Zealand

For example, in the 30-34 age group, an age group where census data does not appear to suffer so much from undercounts or people temporarily overseas, in 2001 in all regions there were more women than men.

Table 8 takes the geographic analysis down to the level of territorial local authority (TLA). It shows the five authorities with the highest number of men aged 25-34 relative to women in this age group (this combined age group is used to increase numbers in each cell). Even at this level of analysis, and in this age group, there was only one area where men strongly outnumbered women, and this was Otorohanga District (Table 8) that can be primarily attributed to the presence of a large male prison. Similarly, the slightly higher ratio for Upper Hutt City is due to the presence of a prison and an army base in Trentham.

Table 8: Top five Territorial Local Authorities in terms of the number of men relative to women, age group, 25-34, 2001

	Ratio	Number of excess men
Otorohanga District	0.77	165
Upper Hutt City	0.99	33
Kaikoura District	0.87	30
Southland District	0.98	30
Waitomo District	0.95	27

Source: Census, Statistics New Zealand

Finally, Table 9 has sex ratios for men and women by single year of age from 25 to 40. The starting point of 25 is chosen to remove most of those individuals still completing their schooling and tertiary education. The 40-year cut-off is around the point that men start to outnumber women in terms of holding a degree or higher qualification.

The table illustrates that in the older age groups the number of qualified men outnumber the number of qualified women, while in the younger age groups this strongly reverses. In particular, in the younger age groups the number of women with degrees or higher qualifications greatly outnumbers men. Equally, in the younger age groups the number of men with no formal educational qualifications outnumbers women. Enrolment data for July 2003 also show major imbalances. Overall there were 39 percent more women than men enrolled in tertiary education institutions in New Zealand, or nearly 55,000 more women than men (Ministry of Education 2005). Some areas of education participation are particularly female dominated, such as Colleges of Education (over 4 times as many women) and Wananga (nearly 2.3 times). It is difficult to unpick the possible effect of differential migration from the higher overall participation rates of women (in all age groups) in tertiary education. It may be that the two trends are reinforcing each other.

Table 9: Ratio of women to men in each level of educational qualification, 2001

Age	No qualifications	School	Other tertiary	Degree or higher	Total
25	0.81	1.02	1.17	1.35	40,362
26	0.88	1.07	1.16	1.35	42,510
27	0.91	1.14	1.10	1.40	44,232
28	0.88	1.20	1.09	1.37	46,143
29	0.91	1.22	1.03	1.32	49,008
30	0.93	1.29	1.03	1.31	49,671
31	0.94	1.34	0.99	1.16	50,412
32	0.92	1.44	0.93	1.19	50,271
33	0.93	1.44	0.92	1.14	50,187
34	0.91	1.41	0.94	1.04	50,742
35	0.92	1.36	0.92	1.07	50,856
36	0.91	1.45	0.90	1.07	52,446
37	0.91	1.39	0.94	1.05	54,498
38	0.94	1.38	0.93	1.03	55,878
39	0.94	1.34	0.97	0.99	55,239
40	0.95	1.39	0.98	0.95	54,399
Total	0.91	1.31	0.99	1.17	796,854

Source: Census, Statistics New Zealand

Over the long term women, including mothers of young children, have been increasing their labour market participation rates and by early 2005 participation rates for women in New Zealand were at a post war high. While many factors have been driving the increasing participation of women, one key factor is the increasing educational attainment.

Differential mortality

A possible explanation for a systematic widening differential in the numbers of males and females across a broad age range is changes in patterns of age-sex specific mortality rates. This was not considered to be a particularly likely explanation for the declining ratio of males to females in the prime working and child-bearing age groups over the past 25 years, but it was one that needed to be examined briefly if for no other reason than to discount it.

At this stage, the analysis has been confined to an examination of selected characteristics of mortality for New Zealand's total male and total female populations as these are reported in the life tables prepared by Statistics New Zealand for 1970-72, 1980-82, 1990-92 and 2000-2002. The simple index that was used to compare mortality over time for males and females in the age groups between 20-24 years and 45-49 years was the sex ratio of the numbers of deaths (dx) in the age interval, as these are recorded in the life tables. The dx values are not the actual deaths that occurred in any given year; they are

the deaths that would have occurred in the hypothetical male and female life table populations according to the age-specific mortality rates that are used to derive the life table. These age specific mortality rates are derived from the actual mortality experience of the male and female populations in the years the life table refers to.

The advantage of the dx measure of deaths is that for both males and females they relate to two hypothetical birth cohorts, each of 100,000 births. These birth cohorts are progressively diminished by the mortality rates. The sex ratios for the numbers of deaths at each age group would be very close to 1.0 if there was very little difference in the incidence of death by age and sex amongst the male and female birth cohorts. They would be less than 1.0 if the number of male deaths was higher than the number of female deaths. Given that male mortality is higher than female mortality at all ages from birth in the industrialized countries, it is expected that sex ratios, where these are expressed in terms of female events per male event, would be below 1.0 for the life table deaths (dx).

The results of this simple analysis for the male and female life tables at 10 year intervals since 1970-72 are shown in Table 10.[6]

Table 10: Sex ratios for Life Table deaths (dx), 1970-72 to 2000-02

Age group	1970-72	1980-82	1990-92	2000-02
20-24	0.37	0.39	0.29	0.37
25-29	0.49	0.41	0.35	0.38
30-34	0.63	0.58	0.52	0.47
35-39	0.69	0.66	0.58	0.55
40-44	0.72	0.72	0.73	0.65
45-49	0.71	0.77	0.76	0.73

Two well-established features of mortality in New Zealand's population emerge from the sex ratios in this table. Firstly, there is the expected higher male than female mortality at all ages that is shown in the sex ratios (female deaths as a ratio of male deaths). Secondly, there is the much higher differential in mortality between males and females in the 20s age groups, especially the 20-24 year olds, where the incidence of death amongst males from accidents, especially on the roads, is much higher than for females.

The surprising feature of the ratios is the tendency for the disparities in male and female mortality to widen over time, rather than to diminish in virtually all of the age groups shown except the late 40s. The falling sex ratios for the 30-34 year and 35-39 year age groups were unexpected; the ratios for these age groups in 1970-72 were more than 10% higher than those recorded for 2000-02 (Table 10).

[6] A similar pattern is evident when based on New Zealand Census-Mortality Study (Appendix 2).

We have not delved into the causes of the widening gap in mortality between men and women in their 30s, but the fact that there appears to have been a systematic trend towards more male deaths in relation to those for females in the same age groups would suggest that differential mortality has been contributing in a small way to the growing disparity in numbers of males and females enumerated in the resident population between the early 1980s and the early 2000s. Changes in patterns of mortality cannot be completely discounted in explanations for the increasing surplus of women over men in the age group 20-49 years.

In fact, if we were to consider the survivorship data from these same life tables, we find that, based on an assumed sex ratio at birth of 105 males for each 100 female babies, that by the age 25 we would expect to find that there would be 102.9 male and 98.8 female survivors (i.e. an expected sex ratio of 0.96) and a sex ratio of 1.0 is not reached until after age 60 years. Any deviation from this can only arise from migration or some non-demographic process such as undercount, or excess deaths due to war or epidemic.

Migration

The composition of the New Zealand population, including the relative numbers of women and men, is influenced by migration into and out of New Zealand. International migrant flows to countries such as New Zealand, Australia, the US and Canada have traditionally been male dominated, so immigrant communities have often been characterized by uneven sex ratios. For example, the average sex ratio among immigrants arriving in the United States from 1820-1920 was about one and half times as many men as women (Hutchinson, 1956). As a New Zealand example, the Dalmatians came to New Zealand during the latter years of the nineteenth century to escape from the depressed economic conditions of their homeland. The New Zealand Dalmatians were few in number, and men vastly outnumbered women. Of the original 5,468 settlers between 1897 and 1919, only 177 were women (Stoffel, 1982 cited in Sussex, Comrie and Corbett 2002).

What are some of the possible forces behind gendered migration? One is that men may be more mobile potentially due to weaker family ties. If this is the case, men may also be more likely than women to remain overseas should they leave New Zealand for travel and work. Another is that international labour markets can encourage gendered migration. At one extreme, this can be seen in the significant number of mainly women traveling from countries such as the Philippines and Indonesia to the Middle East, but also to countries such as the United States, Singapore and possibly New Zealand, to undertake paid domestic duties. Some of these will be temporary migrants with no opportunities to stay long term in the host country, while others will be longer-term migrants (e.g. Momsen, 1999; Parreñas, 2001; Yeoh and Huang, 2000). In contrast, a shortage of tradespeople, a traditionally male occupation, in a particular country will tend to attract male migrants. However, more subtle factors may be influencing gendered migration. For example, "satellite" Asian families in New Zealand, where the male returns to work in Asia will result in "missing men". Brides brought in from Asia and Russia via "bridal" catalogues could result in a small influx of women relative to men into New Zealand. Such practices

are not new and have been adopted traditionally to address gender imbalances. Increased ease of communication (e.g. internet) and travel would be expected to make these strategies simpler. But yet, there is no evidence of New Zealand women 'shopping' for partners overseas.

No one dataset can provide a full picture of gendered migration in or out of New Zealand Therefore the following section draws on a range of sources of data. The first set of data allows an assessment of change in "stocks" rather than flows.

Stock data

The census can be used to give some idea of changes in "stock" of people over time. Table 11 shows the size of each cohort as it ages relative to its size when the men and women were in the 15-19 age group. These are New Zealand born individuals. Overall the table shows men 'disappearing" faster than women in each cohort. In addition, the rate of men and women disappearing has increased amongst younger cohorts. For example for those 15-19 year old men born in 1957-61, it took to age 40-44 before a quarter had gone. But in the cohort born in 1972-76 over a quarter had gone by age 25-29. However, it should be noted that these data do not take into account undercounts.

Table 11: Size of each cohort as it ages – New Zealand born men and women compared

	Females				Males			
	Born in 1957-61	1962-66	1967-71	1972-76	1957-61	1962-66	1967-71	1972-76
15-19	100	100	100	100	100	100	100	100
20-24	88	90	87	89	88	88	85	84
25-29	86	84	83	79*	82	77	76	71*
30-34	85	84	82*		79	76	72*	
35-39	83	83*			76	74*		
40-44	81*				74*			

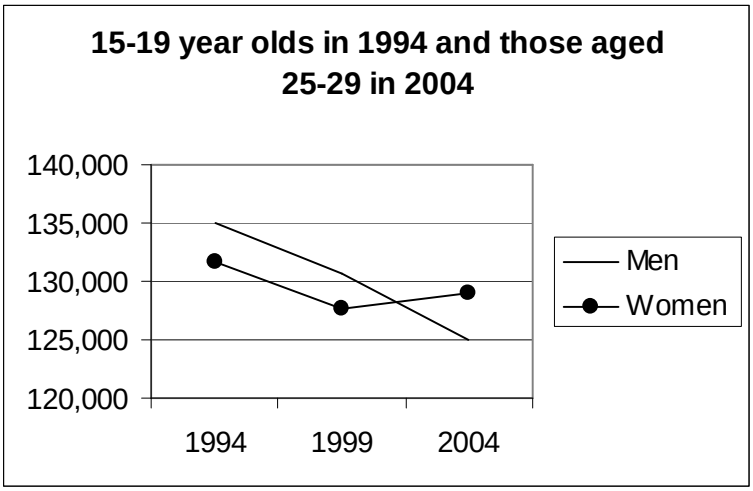
Source: Census, Statistics New Zealand
* 2001 data

Population Estimates should give a better idea of changes in the New Zealand "stock" of women and men over time because, as already discussed, they adjust for undercounts and those temporarily overseas. Figure 2 traces the size of cohorts of 15-19 year olds across five-year time spans from 1994 through to 2004. Figure 3, for the cohorts of 30-34 year olds in 2004 begins in 1989 when they were aged 15-19 years.

These are not true cohorts as they include new immigrants and some people in the original counts will have migrated overseas. If New Zealand had a closed economy, the pattern that would be observed in both Figures 2 and 3 would be a slow decline in the number of women and men due to mortality. With migration, what we observe in Figure 2 is a decline in the number of women and men in the time that 15-19 year olds turn into 20-24 year olds, a continuing decline in men through to ages 25-29, but a pick-up in the

number of women through to 2004. The result is that in 2004 there are more women than men in the 25-29 age group.

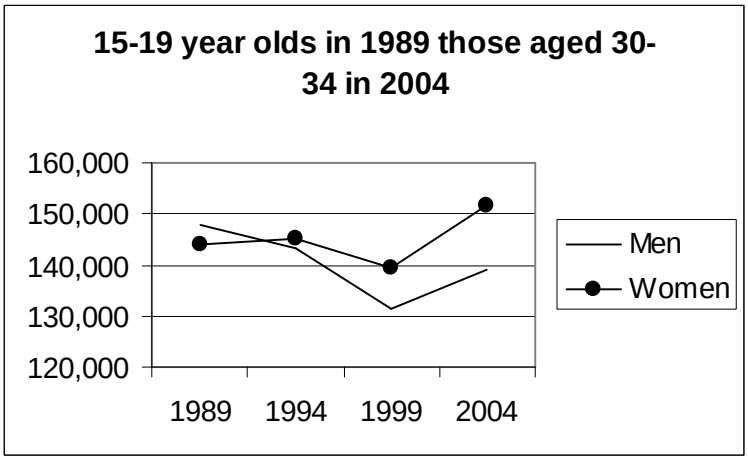
Figure 2



Source: Estimated Resident Population estimates, Statistics New Zealand

Figure 3 starts earlier and so the cohort of 15-19 year olds is aged 30-34 in 2004. This figure also shows a decline in the early period, a cross-over in the number of women and men in the early 1990s, then a growth in the number of women and men since 1999. By 2004 there were, again, more women than in the starting period. Assuming the estimates are correct, only strong inward migration of women over the long term could lead to a situation where the total number of women was greater in 2004 than in 1989.

Figure 3



Source: Estimated Resident Population estimates, Statistics New Zealand

While there are problems in using census data to measure changes in "stocks", one advantage is that information is available on where people are born. Table 12 shows sex ratios for New Zealand born versus overseas born in the under 15 age group and in the

20-49 age range.[7] It shows the standard pattern of there being more boys than girls in the younger age groups in both New Zealand and overseas born.

Table 12: Sex ratios in New Zealand for New Zealand born and overseas born, 2001

	Under 15	20-24	25-29	30-34	35-39	40-44	45-49
Overseas born	0.94	1.06	1.19	1.21	1.14	1.10	1.05
NZ born	0.95	1.02	1.08	1.09	1.08	1.05	1.04

Source: Census, Statistics New Zealand

Table 12 indicates that the sex ratios of the stock of overseas born New Zealand residents were higher in 2001 than for New Zealand born. However, the ratios for New Zealand born are still high and this group represents just under 80 percent of the population in the 20-49 age group. Therefore, while long-term migration to New Zealand appears to have had an influence on sex ratios, this table again indicates that changes occurring among the New Zealand born population dominate overall trends.

Given the very strong ratios for well-qualified women to men in young age groups, it is worth examining how migration might be affecting this ratio. Table 13 examines sex ratios for New Zealand and overseas born in each highest qualification and age group in 2001. In terms of tertiary educated people, it indicates that women greatly outnumber men amongst both New Zealand born and overseas born in the younger age groups. But in most age groups the ratio is higher amongst those born overseas.

Table 13: Sex ratios for New Zealand and overseas born in each highest qualification and age group, 2001

	Total				Sex ratios			
	School qualification or less		Tertiary qualification		School qualification or less		Tertiary qualification	
	NZBorn	OSBorn	NZBorn	OSBorn	NZBorn	OSBorn	NZBorn	OSBorn
20-24	114,015	25,707	62,139	11,730	0.91	0.95	1.33	1.39
25-29	106,980	20,985	75,198	18,333	1.05	1.13	1.19	1.33
30-34	122,238	28,674	74,517	24,984	1.20	1.24	1.00	1.19
35-39	129,207	33,339	76,551	28,818	1.20	1.23	0.95	1.05
40-44	121,128	31,368	77,772	25,902	1.16	1.23	0.96	0.97
45-49	106,929	28,602	65,412	21,837	1.12	1.20	0.94	0.89

Source: Census, Statistics New Zealand

As indicated in the ethnicity sex ratios (Tables 4 and 5), the ratio of women to men amongst Asians is particularly high. Table 14 explores the sex ratios of New Zealand born and overseas born New Zealand residents by main ethnic group. It also shows the proportion of each group born overseas. A number of patterns emerge as important. First,

[7] These data provide no idea of how long the overseas born residents have been in New Zealand. In addition, some of those overseas born will have New Zealand born parents and will have been born while their parents were living in an overseas country.

a very high proportion of the Asian and 'Other" group, and to lesser degree older Pacific Peoples, were born overseas. Second, in the younger age range for all ethnic groups, except 'Other', the ratio of women to men is high amongst those born overseas. This ratio is particularly high amongst Asians, with 30 percent more women than men in the 25-29 age group and 43 percent more in the 30-34 age group.

Table 14: Sex ratios for New Zealand and overseas born in each ethnic group, total counts, 2001

	Actual numbers		Sex ratio		Overseas born as % of total specified
	NZBorn	OSBorn	NZBorn	OSBorn	
European Ethnic Group					
20-24	152,493	14,322	1.03	1.05	8.6
25-29	160,632	18,954	1.09	1.21	10.6
30-34	178,071	28,143	1.10	1.16	13.6
35-39	188,619	33,525	1.08	1.11	15.1
40-44	186,507	32,718	1.06	1.03	14.9
45-49	166,557	30,966	1.04	1.00	15.7
Maori Ethnic Group					
20-24	41,004	759	1.10	1.08	1.8
25-29	39,366	480	1.17	1.11	1.2
30-34	38,595	348	1.16	1.30	0.9
35-39	37,650	294	1.14	0.85	0.8
40-44	32,289	177	1.13	1.15	0.5
45-49	24,627	129	1.08	0.72	0.5
Pacific Peoples Ethnic Group					
20-24	12,762	6,888	1.06	1.14	35.1
25-29	9,387	8,463	1.10	1.09	47.4
30-34	6,660	10,998	1.14	1.16	62.3
35-39	4,893	11,007	1.09	1.10	69.2
40-44	2,937	9,711	1.09	1.08	76.8
45-49	1,491	8,565	0.90	1.02	85.2
Asian Ethnic Group					
20-24	3,297	20,622	1.01	1.06	86.2
25-29	2,451	15,456	1.01	1.30	86.3
30-34	2,259	17,574	1.03	1.43	88.6
35-39	2,046	20,556	0.96	1.26	90.9
40-44	1,731	17,979	0.96	1.30	91.2
45-49	1,242	14,385	0.94	1.24	92.1
Other Ethnic Group					
20-24	297	1,707	0.87	0.97	85.2
25-29	225	1,713	0.97	0.94	88.4
30-34	183	2,241	0.88	0.78	92.5
35-39	180	2,196	0.76	0.85	92.4
40-44	159	1,806	1.08	0.85	91.9
45-49	132	1,287	1.10	0.86	90.7

Source: Census, Statistics New Zealand

Table 15 delves further into the ethnic component of sex ratios of those born overseas. It provides examples of level 3 ethnic groups where there are more women born overseas than men. The individual numbers in each ethnic group are relatively low but a number of Asian groups are important either in terms of extreme ratios or numbers (eg. Chinese not further defined).

Table 15: Numbers and sex ratios of overseas born New Zealand residents, top sixteen ratios, Level 3 ethnic groups, 2001

	Male	Female	Ratio female to male
Thai/Tai/Siamese	564	1,506	2.67
Filipino	1,275	3,252	2.55
Japanese	1,245	2,775	2.23
Asian nfd	375	699	1.86
Canadian	618	1,011	1.64
European nfd	2,895	4,473	1.55
German*	1,062	1,563	1.47
American (US)*	1,062	1,563	1.47
Korean	2,607	3,579	1.37
Russian	435	591	1.36
Chinese nfd	11,163	14,835	1.33
Australian	2,838	3,753	1.32
British nfd	2,736	3,573	1.31
South African	2,595	3,147	1.21
Cook Island Maori nfd	2,877	3,309	1.15
Samoan	9,255	10,545	1.14

Source: Census, Statistics New Zealand
* It is a coincidence that these numbers are exactly the same

Some of the Thai and Filipino women will be coming into New Zealand to marry New Zealand men (or the New Zealand men may have married them overseas), while others will be coming in alone in order to undertake paid work. However, despite some Asian groups being important, and overall sex ratios for Asians (see Table 4) being high, there are other groups where the ratios are high. The reasons for this are not known. For instance, it may be that women are more likely to retain the ethnicity of the country they were born in (such as German) rather than (or as well as), for example, recording a group such as New Zealand European. However, when these data are examined by birthplace it transpires that there is little difference between the ratios for those born in New Zealand and those born overseas, though there are differences when level of education is considered.

Census 'stock' data: New Zealanders in Australia and the UK

When the initial media coverage of this project appeared in the *Sunday Star-Times* on 27 March 2005 (Laugesen and Courtney, 2005: A5) under the headline "Where have all the Kiwi blokes gone?" there was an immediate response from across the Tasman. Nick Leys (2005: 8), writing in *The Australian* on Monday March 28 observed in his regular column ("Strewth") that New Zealand's "manhood" might be found by "going on a pub crawl around Bondi and Manly with a clipboard".

We concentrate on Australia and UK in this section as it is where the majority of New Zealand expatriates are living. For a breakdown of the main places out of their own home country that New Zealanders and Australians are living see Appendix 3.

It was anticipated that amongst the large population of New Zealanders resident in Australia there might well be a surplus of males in the prime working age groups, especially given the very extensive migration since the late 1980s. A preliminary examination of the Australian census data for 2001 indicated that sex-selective migration to Australia was not the simple answer to New Zealand's widening disparities in numbers of men and women aged 20-49 years. In fact in all of the five year age groups between 20-24 and 45-49 years, the ratio of females to males who had been born in New Zealand (the only way a "New Zealand" population in Australia can be defined in the Australian census) was very close to 1.0 (Table 16). Numbers of New Zealand-born males and females at each age group in Australia's population do not differ much. Overall, in the 20-49 age group these data indicate there were 1,467 more New Zealand men than women in Australia. A separate analysis of the Maori population resident in Australia also revealed that there was a small surplus of men (746) over women in the total Maori ancestry population (72,970) usually resident in that country in 2001 (Bedford et al. 2004, 135). When the population universe is restricted to the 20-49 year age group there is, in fact a small female surplus in Australia's Maori population – 193 or 0.53% of the 37,519 in this age group.

Census data from the UK, the second most important location of expatriate New Zealanders, adds further complexities to where the 'missing men' might be located. Table 16 shows the numbers of those people born in New Zealand recorded in the 2001 UK census. It also includes a subset of the London region. In the total UK data, in the 20-24, 25-29, 40-44 and 45-49 age groups women outnumber men. However, in the important 30-34 and 35-39 age groups men outnumber women. Yet, the numbers are relatively small in these age groups. In total in the broad 30-39 age group there were only 565 more New Zealand men than women. Overall, in the 20-49 age group these data indicate that there were 1,885 more woman than men in the UK (For similar, and even more puzzling, data on Australians in the UK see Table 2, Appendix 3).

Table 16: Sex ratios for the New Zealand born population in Australia and the UK, 2001

		Australia	UK		UK subset - London	
Age group	Total	Sex ratio	Total	Sex ratio	Total	Sex ratio
20-24	27,038	1.02	5,137	1.43	2,915	1.66
25-29	36,616	0.98	14,813	1.17	10,186	1.20
30-34	38,906	1.01	10,098	0.93	5,768	0.91
35-39	40,521	0.98	6,685	0.94	2,773	0.95
40-44	39,392	0.99	4,507	1.04	1,608	1.06
45-49	33,818	0.94	3,171	1.23	1,027	1.15

Sources: Australian and UK censuses

When considering these data on the New Zealand born in Australia and the UK it is important to appreciate that no adjustments have been made for underenumeration in either country. The small surplus of females over males aged 20-24 years in Australia could well be removed once the effects of the commonly found underenumeration of young men referred to earlier is taken into account. In the UK the surpluses of females over males in the age groups 20-24 and 25-29 could also reflect underenumeration of young men; indeed the relatively low numbers of New Zealand-born in the UK in all age groups except 25-29 are surprising given the significance of this country as a destination for migrants from New Zealand. On the basis of the evidence contained in Table 16, it is not possible to find an easy answer to the sex ratio imbalance in the age group 20-49 in New Zealand.

When both the Australia and the UK are considered, their census data indicate that in the 20-49 in 2001 there were a total of 418 more New Zealand women than men in these countries. Further research on the age and gender characteristics of New Zealanders in Australia is in progress, but it is not expected that we will find "NZ's lost manhood" in Australia (or the UK), to use Leys' felicitous phrase.

Flow data: Gendered migration, 1980-2004

The arrival/departure data collected continuously by Statistics New Zealand provide the most useful data base for assessing whether there are growing differences, on the basis of gender, in the flows of people into and out of New Zealand. In this section we focus on two sets of flows relating, respectively, to New Zealand citizens and to non-New Zealand citizens (anyone travelling on a passport for a country other than New Zealand). There are some differences in the gender balance amongst Permanent Long Term (PLT) migrants from the major source regions for New Zealand's immigrants.[8] We examine these briefly in this section as well.

[8] Permanent and long-term (PLT) arrivals include people who arrive in New Zealand intending to stay for a period of 12 months or more (or permanently), plus New Zealand residents returning after an absence of 12 months or more. Included in the former group are people with New Zealand residency as well as students and holders of work permits. Permanent and long-term departures include New Zealand residents departing

The New Zealand citizen flows

During the 25 years between 1 July 1979 and 30 June 2004 just over 1 million (1,076,200) New Zealand citizen PLT departures were recorded in the Statistics New Zealand migration data base. There were more males (551,860) than females (524,340) in this outflow – a difference of 27,520. In most of the five year age groups the ratio of females to males was just under 1 (Table 17). The only age groups where the numbers of females exceeded those for males were: 15-19 years (11,193; sex ratio of 1.24), 20-24 years (4,267; sex ratio 1.03), 60-64 years (702; sex ratio 1.17), 70-74 years (211; sex ratio 1.09) and 75 years and over (918; sex ratio 1.43) (Table 17).

Table 17: New Zealand citizen PLT departures, 1980-2004 (June years)

Age group	M	F	F-M	F/M
Under 5 Years	39096	36999	-2097	0.95
5 - 9 Years	31388	30028	-1360	0.96
10 - 14 Years	26303	25183	-1120	0.96
15 - 19 Years	45888	57081	11193	1.24
20 - 24 Years	141792	146059	4267	1.03
25 - 29 Years	105390	87361	-18029	0.83
30 - 34 Years	51977	42376	-9601	0.82
35 - 39 Years	35019	29059	-5960	0.83
40 - 44 Years	23997	20862	-3135	0.87
45 - 49 Years	17110	15718	-1392	0.92
50 - 54 Years	12893	11659	-1234	0.90
55 - 59 Years	8182	7583	-599	0.93
60 - 64 Years	4249	4951	702	1.17
65 - 69 Years	4128	3844	-284	0.93
70 - 74 Years	2329	2540	211	1.09
75 Years and Over	2119	3037	918	1.43
Total	551860	524340	-27520	0.95
20-49 years	375,285	341,435	-33850	0.91

In the broad age group that is of particular interest in this analysis, the 20-49 year olds, emigrant males (375,285) outnumbered females (341,435) by 33,850 – a larger difference than is found for the total outflow.

It was noted earlier in the paper that the gap between numbers of males and females aged between 20 and 49 years in the New Zealand resident population has been widening since

for an intended period of 12 months or more (or permanently), plus overseas visitors departing from New Zealand after a stay of 12 months or more.

the early 1990s. If we examine the gender balance in the New Zealand citizen departure flows, by five year period between 1980 and 2004 we find that the differences between the numbers of males and females were, in fact, much higher in the 1980s than they were in the 1990s and early 2000s (Table 18).

Table 18: New Zealand citizen PLT departures, 1980-2004: differences in numbers of females from males by age group (June years)

Age group	1980-84	1985-89	1990-94	1995-99	2000-04	1980-04
Under 5 Years	-487	-258	-406	-517	-429	-2097
5 - 9 Years	-419	-171	-276	-292	-202	-1360
10 - 14 Years	-346	-211	-177	-238	-148	-1120
15 - 19 Years	3550	3953	1799	1416	475	11193
20 - 24 Years	-536	-1160	1884	1889	2190	4267
25 - 29 Years	-4170	-5372	-2980	-3357	-2150	-18029
30 - 34 Years	-2097	-2678	-1434	-2034	-1358	-9601
35 - 39 Years	-1407	-1646	-700	-990	-1217	-5960
40 - 44 Years	-744	-966	-250	-495	-680	-3135
45 - 49 Years	-485	-433	-245	-185	-44	-1392
50 - 54 Years	-352	-475	-168	-121	-118	-1234
55 - 59 Years	-152	-241	-160	-15	-31	-599
60 - 64 Years	98	278	225	145	-44	702
65 - 69 Years	19	-66	-109	-163	35	-284
70 - 74 Years	9	95	76	20	11	211
75 Years and Over	84	103	189	281	261	918
Total	-7435	-9248	-2732	-4656	-3449	-27520
20-49 years	-9439	-12255	-3725	-5172	-3259	-33850

The growing disparity in numbers of females in the key reproductive and labour force age groups (20-49 years) in New Zealand's resident population, especially since 1991, cannot be accounted for by an increasing gender imbalance in the outflow of New Zealand citizens. If anything, the sex ratios in the outflow have narrowed rather than increased in these age groups over the 25 years (Table 19). **Emigration** of New Zealanders has contributed cumulatively to the disparities between numbers of males and females in New Zealand's population, but it is not the simple answer to the age-specific sex ratio differences that have become much more apparent in recent censuses.

Table 19: New Zealand citizen PLT departures, 1980-2004: ratios of females to males

Age group	1980-84	1985-89	1990-94	1995-99	2000-04	1980-04
Under 5 Years	0.95	0.97	0.93	0.93	0.95	0.95
5 - 9 Years	0.94	0.97	0.93	0.95	0.97	0.96
10 - 14 Years	0.94	0.97	0.95	0.95	0.98	0.96
15 - 19 Years	1.36	1.35	1.23	1.18	1.05	1.24
20 - 24 Years	0.98	0.97	1.08	1.08	1.09	1.03
25 - 29 Years	0.77	0.77	0.81	0.85	0.91	0.83
30 - 34 Years	0.78	0.76	0.81	0.81	0.89	0.82
35 - 39 Years	0.75	0.79	0.85	0.87	0.87	0.83
40 - 44 Years	0.78	0.81	0.93	0.90	0.90	0.87
45 - 49 Years	0.78	0.87	0.91	0.95	0.99	0.92
50 - 54 Years	0.79	0.79	0.91	0.96	0.97	0.90
55 - 59 Years	0.86	0.84	0.87	0.99	0.99	0.93
60 - 64 Years	1.20	1.41	1.38	1.13	0.97	1.17
65 - 69 Years	1.04	0.92	0.86	0.87	1.04	0.93
70 - 74 Years	1.04	1.22	1.20	1.03	1.02	1.09
75 Years and Over	1.53	1.28	1.54	1.38	1.51	1.43
Total	0.93	0.93	0.97	0.96	0.97	0.95
20-49 years	0.87	0.86	0.94	0.93	0.96	0.91

What about return migration flows? Are there larger numbers of females returning after an absence of 12 months or more overseas? Is sex-selective return migration of New Zealand citizens a significant contributor to the widening disparities in numbers of males and females in the resident population?

Table 20 indicates that over the 25 years between 1 July 1979 and 30 June 2004 the number of male New Zealand citizens returning after an absence of 12 months (292,526) was marginally larger than the number of females returning (291,223). The difference was 1,303 more males. When the numbers aged 20-49 years are considered this difference narrows slightly to 1,203 (Table 20). The only age groups where there were more females than males in the return flow are: 15-19 years (1.18), 20-24 years (1.23), and the three age groups above 64 years. These are essentially the same age groups that had the higher numbers of females in the departure flows. There is little evidence in the aggregate statistics for the 25 years of any systematic tendency for New Zealand citizen males to be less likely to return than females in the PLT migration statistics.

Table 20: New Zealand citizen PLT arrivals, 1980-2004 (June years)

Age group	M	F	F-M	F/M
Under 5 Years	19915	18797	-1118	0.94
5 - 9 Years	17444	16411	-1033	0.94
10 - 14 Years	14811	14320	-491	0.97
15 - 19 Years	15181	17845	2664	1.18
20 - 24 Years	47844	59065	11221	1.23
25 - 29 Years	73039	72556	-483	0.99
30 - 34 Years	39331	33955	-5376	0.86
35 - 39 Years	22288	18602	-3686	0.83
40 - 44 Years	13763	11658	-2105	0.85
45 - 49 Years	9136	8362	-774	0.92
50 - 54 Years	6884	6760	-124	0.98
55 - 59 Years	5408	5060	-348	0.94
60 - 64 Years	3511	3095	-416	0.88
65 - 69 Years	1840	1935	95	1.05
70 - 74 Years	1057	1283	226	1.21
75 Years and Over	1074	1519	445	1.41
Total	292526	291223	-1303	1.00
20-49 years	205,401	204,198	-1203	0.99

The surpluses and deficits of males over females during the different five year periods between 1980 and 2004 have fluctuated somewhat, with more females than males in the return flows in the late 1980s and late 1990s – two periods when there was a down-turn in the New Zealand economy towards the end of the decade (Table 21). However, around half of the surpluses of females aged 20-29 years in the return flows during these two periods were offset by the surpluses in male return migrants aged 30-49 years.

There has not been a significant increment to the New Zealand resident female population in the broad age group 20-49 years through return migration. Only the age group 20-24 years had a sizeable surplus of females over males for the 25 years (11,221) and this was more than offset by surpluses of males over females in the return flows aged 25-49 years (12,424) giving the overall deficit of 1,203 females for the age group as a whole (Table 21).

Return migration of New Zealand citizens does not hold the answer to the sex ratio puzzle; women are not more likely to be return migrants than men, especially when the statistics are aggregated for periods of five or more years and the idiosyncratic features of flows in particular years are hidden in the broader patterns. More women than men do tend to return in years when the economy in New Zealand is weak, but over the past 25 years at least this gender imbalance, which has been commented on at times, is not sustained in the aggregate.

Table 21: New Zealand citizen PLT arrivals, 1980-2004: differences in numbers of females from males by age group (June years)

Age group	1980-84	1985-89	1990-94	1995-99	2000-04	1980-04
Under 5 Years	-107	-179	-293	-237	-302	-1118
5 - 9 Years	-141	-220	-224	-196	-252	-1033
10 - 14 Years	-159	-168	-35	-132	3	-491
15 - 19 Years	829	693	503	363	276	2664
20 - 24 Years	3098	2722	2863	1769	769	11221
25 - 29 Years	-1743	324	-462	1072	326	-483
30 - 34 Years	-1651	-841	-1373	-708	-803	-5376
35 - 39 Years	-935	-794	-684	-550	-723	-3686
40 - 44 Years	-458	-445	-573	-291	-338	-2105
45 - 49 Years	-203	-254	-62	-216	-39	-774
50 - 54 Years	-181	-143	27	47	126	-124
55 - 59 Years	-49	-113	-158	-22	-6	-348
60 - 64 Years	-41	-100	-154	-45	-76	-416
65 - 69 Years	61	25	43	8	-42	95
70 - 74 Years	31	25	28	74	68	226
75 Years and Over	59	54	103	139	90	445
Total	-1590	586	-451	1075	-923	-1303
20-49 years	-1892	712	-291	1076	-808	-1203

The sex ratios for the return migration flows bear this conclusion out. There is not quite the same degree of convergence in sex ratios by age group and period amongst the return flows as there was in the outmigration flows (Table 22). In the age groups 20-24 and 25-29 years the ratio of females to males has been falling, especially since the late 1980s, rather than rising, indicating shrinking differences between the numbers of female and male return migrants. In the older age groups (30-49 years) there is a tendency for the ratio of females to males to rise and get closer to parity in the late 1990s and early 2000s than it was in the 1980s. However, there is still a surplus of males over females in the return flows in these age groups (Tables 21 and 22).

Table 22: New Zealand citizen PLT arrivals, 1980-2004: ratios of females to males

Age group	1980-84	1985-89	1990-94	1995-99	2000-04	1980-04
Under 5 Years	0.97	0.95	0.93	0.94	0.92	0.94
5 - 9 Years	0.97	0.93	0.93	0.94	0.92	0.94
10 - 14 Years	0.96	0.94	0.99	0.95	1.00	0.97
15 - 19 Years	1.27	1.24	1.15	1.12	1.10	1.18
20 - 24 Years	1.24	1.28	1.27	1.23	1.11	1.23
25 - 29 Years	0.89	1.03	0.97	1.08	1.02	0.99
30 - 34 Years	0.79	0.87	0.84	0.91	0.91	0.86
35 - 39 Years	0.77	0.81	0.84	0.88	0.86	0.83
40 - 44 Years	0.78	0.81	0.81	0.90	0.90	0.85
45 - 49 Years	0.84	0.83	0.97	0.90	0.98	0.92
50 - 54 Years	0.83	0.86	1.02	1.03	1.06	0.98
55 - 59 Years	0.94	0.87	0.85	0.98	1.00	0.94
60 - 64 Years	0.92	0.83	0.79	0.94	0.92	0.88
65 - 69 Years	1.23	1.09	1.12	1.02	0.92	1.05
70 - 74 Years	1.22	1.18	1.13	1.31	1.22	1.21
75 Years and Over	1.66	1.45	1.51	1.43	1.27	1.41
Total	0.97	1.01	0.99	1.02	0.98	1.00
20-49 years	0.96	1.02	0.99	1.03	0.98	0.99

When the PLT net migration gains and losses for New Zealand citizens are examined, it can be seen that New Zealand lost just under 259,334 males and 233,117 females through international migration in the 25 years between June 1980 and June 2004 (Table 23). The overall surplus of males over females in the net loss (26,217) was slightly less than the surplus of males over females in the PLT departure flows (27,520) because a small surplus of males in the return migration flow (1,303) made a minor contribution to offsetting the much larger surplus in the departure flow (Tables 18 and 21). A similar thing happened with the surplus of males over females in the net losses for age group 20-49 years. In this age group there were net losses of 169,884 males and 137,237 females during the 25 years, with the surplus of males being 32,647 – marginally lower than the surplus of 33,850 males in the New Zealand citizen PLT departure flows for those aged 20-49 years (Tables 23 and 18).

When the sex ratios for the net losses are examined by five year age group it can be seen that a somewhat different pattern emerges from that for the PLT departures. The only age group under 60 years that has fewer males than females in the net losses recorded over the period is the 15-19 year olds where there were 8,529 more females than males giving a sex ratio in favour of females of 1.28. In all of the age groups between 20 and 49 years the net losses of males exceeded those of females, especially in the groups aged 20-24 years (6,954 more males than females, and a sex ratio of 0.93) 25-29 years (17,546; sex ratio 0.46) and 30-34 years (4,224; sex ratio 0.67) (Table 23).

Table 23: New Zealand citizen net migration, 1980-2004 (June years)

Age group	M	F	F-M	F/M
Under 5 Years	-19181	-18202	979	0.95
5 - 9 Years	-13944	-13617	327	0.98
10 - 14 Years	-11492	-10863	629	0.95
15 - 19 Years	-30707	-39236	-8529	1.28
20 - 24 Years	-93948	-86994	6954	0.93
25 - 29 Years	-32351	-14805	17546	0.46
30 - 34 Years	-12646	-8421	4225	0.67
35 - 39 Years	-12731	-10457	2274	0.82
40 - 44 Years	-10234	-9204	1030	0.90
45 - 49 Years	-7974	-7356	618	0.92
50 - 54 Years	-6009	-4899	1110	0.82
55 - 59 Years	-2774	-2523	251	0.91
60 - 64 Years	-738	-1856	-1118	2.51
65 - 69 Years	-2288	-1909	379	0.83
70 - 74 Years	-1272	-1257	15	0.99
75 Years and Over	-1045	-1518	-473	1.45
Total	-259334	-233117	26217	0.90
20-49 years	-169884	-137237	32647	0.81

The surpluses of males over females in the net migration flows, as with the surpluses of males over females in the departure flows, were higher in the 1980s, especially the late 1980s, than they were in the 1990s and early 2000s (Table 24). In Table 24 the positive numbers refer to male surpluses and the negative numbers to female deficits – a slightly different convention from that used in Tables 18 and 21 where surpluses of males are shown as negatives and surpluses of females as positives. The overall message remains the same, however: losses of New Zealand citizen males in the age group 20-49 years were larger in the 1980s than in the 1990s, and emigration of New Zealanders does not seem to account for very much of the widening gap between numbers of males and females at these ages in the resident population since 1991.

The gap in numbers aged 20-49 years in the resident population grew from 13,400 to 30,552 between the 1991 and 1996 censuses (17,172) and from 30,552 to 53,421 between the 1996 and 2001 censuses (22,869). The surplus of New Zealand citizen males over females in the net loss to New Zealand's citizen population in this age group between July 1991 and June 1996 was only 3,349 – less than 20 percent of the overall growth in the male surplus (17,172) during the five years. Between July 1996 and June 2001 the surplus of New Zealand citizen males in the net loss to New Zealand's citizen population in this age group was 6,403 – a higher share (28 percent) of the overall growth in the male surplus (22,869) during the five years. Net out-migration of New Zealand citizens

is clearly not the key contributor to the growing gender imbalance in the age group 20-49 years.

Table 24: New Zealand citizen PLT net migration, 1980-2004: differences in numbers of males from females by age group (June years)

Age group	1980-84	1985-89	1990-94	1995-99	2000-04	1980-04
Under 5 Years	380	79	113	280	127	979
5 - 9 Years	278	-49	52	96	-50	327
10 - 14 Years	187	43	142	106	151	629
15 - 19 Years	-2721	-3260	-1296	-1053	-199	-8529
20 - 24 Years	3634	3882	979	-120	-1421	6954
25 - 29 Years	2427	5696	2518	4429	2476	17546
30 - 34 Years	446	1837	61	1326	555	4225
35 - 39 Years	472	852	16	440	494	2274
40 - 44 Years	286	521	-323	204	342	1030
45 - 49 Years	282	179	183	-31	5	618
50 - 54 Years	171	332	195	168	244	1110
55 - 59 Years	103	128	2	-7	25	251
60 - 64 Years	-139	-378	-379	-190	-32	-1118
65 - 69 Years	42	91	152	171	-77	379
70 - 74 Years	22	-70	-48	54	57	15
75 Years and Over	-25	-49	-86	-142	-171	-473
Total	5845	9834	2281	5731	2526	26217
20-49 years	7547	12967	3434	6248	2451	32647

The non-New Zealand citizen flows

The non-New Zealand citizen PLT flows in and out of New Zealand between 1980 and 2004 produce similar patterns to the citizen flows. In the case of the **immigrants**, males (442,514) outnumbered females (421,827) by 20,687 in the 864,341 PLT arrivals who were not travelling on New Zealand passports (Table 25). This gender imbalance fell to 9,539 when the population universe was restricted to the 20-49 year olds, although the proportion of the 501,975 PLT arrivals in this age group that was the male surplus (1.9 percent) was not that much smaller than the male surplus as a proportion (2.4 percent) of the total immigrant flow. The age groups where females exceeded males were the 20-24 year olds (3,510; sex ratio of 1.06), 25-29 year olds (5,523; sex ratio of 1.10), and all of the age groups above 60 years (Table 25).

Table 25: Non-New Zealand citizen PLT arrivals, 1980-2004 (June years)

Age group	M	F	F-M	F/M
Under 5 Years	34440	31778	-2662	0.92
5 - 9 Years	31585	29045	-2540	0.92
10 - 14 Years	30741	28067	-2674	0.91
15 - 19 Years	55248	52984	-2264	0.96
20 - 24 Years	54632	58142	3510	1.06
25 - 29 Years	57943	63466	5523	1.10
30 - 34 Years	50342	48748	-1594	0.97
35 - 39 Years	40762	36383	-4379	0.89
40 - 44 Years	31599	25109	-6490	0.79
45 - 49 Years	20479	14370	-6109	0.70
50 - 54 Years	11643	8929	-2714	0.77
55 - 59 Years	7555	7129	-426	0.94
60 - 64 Years	5916	6326	410	1.07
65 - 69 Years	4677	4861	184	1.04
70 - 74 Years	2701	3118	417	1.15
75 Years and Over	2251	3372	1121	1.50
Total	442514	421827	-20687	0.95
20-49 years	255757	246218	-9539	0.96

There had been a shift from male surpluses to female surpluses in the 20-49 year age group amongst the immigrants during the late 1990s and early 2000s (Table 26). Before the mid-1990s, males had dominated females in all of the age groups of the non-New Zealand citizen immigrants between ages 25 and 49. Only the age group 20-24 showed a surplus of females over males, and these surpluses were significantly outnumbered by greater numbers of males over females in the ages between 25 and 49 (Table 26).

From 1995, however, especially after the introduction of stricter English language requirements, female immigrants came to exceed males in the age groups 25-29 and 30-34. In the periods 1995-99 and 2000-04 there were more females than males in the 20-49 age group (Table 26). The surpluses were not large – 2,199 and 1,893 respectively – but they were evidence of a feminisation of immigration in the younger reproductive and working ages.

Table 26: Non-New Zealand citizen PLT arrivals, 1980-2004: differences in numbers of females from males by age group (June years)

Age group	1980-84	1985-89	1990-94	1995-99	2000-04	1980-04
Under 5 Years	-374	-418	-613	-785	-472	-2662
5 - 9 Years	-280	-212	-505	-771	-772	-2540
10 - 14 Years	-137	-114	-787	-880	-756	-2674
15 - 19 Years	-15	121	183	-309	-2244	-2264
20 - 24 Years	626	298	9	2285	292	3510
25 - 29 Years	-508	-59	-423	3245	3268	5523
30 - 34 Years	-1205	-994	-938	344	1199	-1594
35 - 39 Years	-1057	-1482	-1082	-358	-400	-4379
40 - 44 Years	-954	-1327	-1599	-1401	-1209	-6490
45 - 49 Years	-490	-777	-1669	-1916	-1257	-6109
50 - 54 Years	-172	-297	-852	-754	-639	-2714
55 - 59 Years	133	-16	-235	-114	-194	-426
60 - 64 Years	236	152	7	11	4	410
65 - 69 Years	103	80	106	-67	-38	184
70 - 74 Years	204	143	128	-10	-48	417
75 Years and Over	235	225	274	236	151	1121
Total	-3655	-4677	-7996	-1244	-3115	-20687
20-49 years	-3588	-4341	-5702	2199	1893	-9539

This feminisation of immigration is clearly evident in Table 27 where the sex ratios for the non-New Zealand citizen PLT arrival flows are shown by age group; for each five year period. Although there are some minor fluctuations in ratios, especially for the 20-24 year olds, and for those aged 40-44 and 45-49, the trend in a number of age groups is towards convergence around ratios of 1.0 and a shift towards small surpluses of females.

The data contained in Tables 26 and 27 do not lend much support to Simon Collins' (2005) recent claim that females are "flocking" to New Zealand -- surpluses of 2,199 in the period 1995-99 and 1,893 for the five years 2000-04 are hardly "flocks" amongst total non-New Zealand citizen PLT arrival flows of 136,453 and 165,975 respectively during the two periods. However, they are signs that females are coming to outnumber males in the flows of people in the key productive and reproductive age groups, and this is a shift that could be having an impact on the gender balance in the resident populations in these age groups.

Table 27: Non-New Zealand citizen PLT arrivals, 1980-2004: ratios of females to males

Age group	1980-84	1985-89	1990-94	1995-99	2000-04	1980-04
Under 5 Years	0.93	0.93	0.90	0.91	0.94	0.92
5 - 9 Years	0.92	0.95	0.91	0.92	0.91	0.92
10 - 14 Years	0.96	0.96	0.87	0.90	0.92	0.91
15 - 19 Years	1.00	1.02	1.02	0.98	0.90	0.96
20 - 24 Years	1.09	1.04	1.00	1.21	1.01	1.06
25 - 29 Years	0.93	0.99	0.96	1.22	1.18	1.10
30 - 34 Years	0.81	0.85	0.89	1.02	1.08	0.97
35 - 39 Years	0.76	0.73	0.86	0.97	0.97	0.89
40 - 44 Years	0.66	0.64	0.75	0.85	0.87	0.79
45 - 49 Years	0.70	0.63	0.61	0.70	0.79	0.70
50 - 54 Years	0.84	0.75	0.64	0.78	0.82	0.77
55 - 59 Years	1.17	0.98	0.83	0.95	0.92	0.94
60 - 64 Years	1.37	1.21	1.01	1.01	1.00	1.07
65 - 69 Years	1.15	1.12	1.15	0.94	0.97	1.04
70 - 74 Years	1.50	1.37	1.30	0.98	0.94	1.15
75 Years and Over	1.72	1.63	1.75	1.39	1.25	1.50
Total	0.93	0.92	0.90	0.99	0.98	0.95
20-49 years	0.88	0.87	0.87	1.03	1.02	0.96

The surpluses of females over males in the age group 20-49 years are not distributed evenly across the main source regions for New Zealand's immigrants. By far the largest numerical share in recent years comes from Asia. These data underpin the census based ethnic sex ratios shown earlier in the paper. However, the trends are not surprising given that almost half of the males and females arriving with the intention of staying for 12 months or more since the mid-1990s have been citizens of countries in Asia (Table 28). The sex ratios for PLT arrivals of Asia country citizens actually fell between 1995-99 (1.13) and 2000-04 (1.05); indeed they were the lowest of the ratios for regions with more women than men in the immigrant flows in the latter period (Table 28).

Australia and North America were also source regions for larger numbers of women than men aged 20-49 years during the most recent five year periods and this is a situation that has prevailed at times since the early 1980s for both regions (again, showing up in the "stock" 2001 census data). The trend towards countries in Europe becoming a source for more female than male immigrants in the 20-49 year age group is a very recent one; through the 1980s and 1990s males dominated in the immigrant European flows, especially in the early 1990s when the sex ratio was only 0.48 (Table 28). The flow of citizens of the United Kingdom and Ireland has been male-dominated through the 25 years since 1980, although there has been a gradual trend towards convergence between numbers of males and females in the PLT flow.

Table 28: Non-NZ citizen PLT arrivals aged 20-49 years by region of citizenship

Citizenship	M	F	M-F	M/F
1980-84				
Australia	5610	5670	60	1.01
Pacific Islands	3636	3116	-520	0.86
Asia	3922	3058	-864	0.78
North America	2122	1853	-269	0.87
Europe	3406	2702	-704	0.79
UK/Ireland	10027	8801	-1226	0.88
Other areas	648	583	-65	0.90
Total non-NZ	29371	25783	-3588	0.88
1985-89				
Australia	5283	5048	-235	0.96
Pacific Islands	4783	4083	-700	0.85
Asia	7634	5931	-1703	0.78
North America	2300	2289	-11	1.00
Europe	2967	2338	-629	0.79
UK/Ireland	8521	7785	-736	0.91
Other areas	1188	861	-327	0.72
Total non-NZ	32676	28335	-4341	0.87
1990-94				
Australia	5557	5494	-63	0.99
Pacific Islands	2934	2443	-491	0.83
Asia	17714	17070	-644	0.96
North America	2032	2113	81	1.04
Europe	6463	3110	-3353	0.48
UK/Ireland	7767	7042	-725	0.91
Other areas	2075	1568	-507	0.76
Total non-NZ	44542	38840	-5702	0.87
1995-99				
Australia	6148	6493	345	1.06
Pacific Islands	4428	3655	-773	0.83
Asia	30468	34454	3986	1.13
North America	2721	3056	335	1.12
Europe	4973	4741	-232	0.95
UK/Ireland	12654	11725	-929	0.93
Other areas	5735	5202	-533	0.91
Total non-NZ	67127	69326	2199	1.03
2000-04				
Australia	5450	5955	505	1.09
Pacific Islands	4757	4472	-285	0.94
Asia	39410	41451	2041	1.05
North America	3183	3730	547	1.17

Europe	5193	5608	415	1.08
UK/Ireland	18164	17160	-1004	0.94
Other areas	5884	5558	-326	0.94
Total non-NZ	82041	83934	1893	1.02

The non-New Zealand citizen immigrant flows, when aggregated across all source regions, produce small surpluses of female arrivals aged 20-49 years in the late 1990s and early 2000s. These are offset, especially in the period 2000-04 by surpluses of females in the outflows of non-New Zealand citizens – as with the inflows, there have been more women than men aged 20-49 years leaving since the mid-1990s (Table 29). The numbers are small, and they also show a shift away from the pattern that prevailed between 1980 and 1995 when more men than women were in the non-NZ citizen outflows. These **re-emigrants** were concentrated in the age groups 25-29 and 30-34 years as well as the prime age group for students: 15-19 years (Table 29).

Table 29: Non-New Zealand citizen PLT departures, 1980-2004: differences in numbers of females from males by age group (June years)

Age group	1980-84	1985-89	1990-94	1995-99	2000-04	1980-04
Under 5 Years	-94	-72	-231	-107	78	-426
5 - 9 Years	-158	-128	-26	-123	-165	-600
10 - 14 Years	-93	-210	-95	-56	-55	-509
15 - 19 Years	469	519	329	186	348	1851
20 - 24 Years	-420	-66	-324	151	59	-600
25 - 29 Years	-819	-265	-359	646	885	88
30 - 34 Years	-696	-376	-590	203	626	-833
35 - 39 Years	-651	-510	-531	-153	66	-1779
40 - 44 Years	-583	-528	-483	-417	-13	-2024
45 - 49 Years	-376	-317	-280	-280	-99	-1352
50 - 54 Years	-67	-180	-172	-78	-58	-555
55 - 59 Years	46	5	-2	-52	30	27
60 - 64 Years	190	101	115	100	111	617
65 - 69 Years	112	60	77	16	42	307
70 - 74 Years	105	97	88	68	11	369
75 Years +	218	141	162	135	97	753
Total	-2817	-1729	-2322	239	1963	-4666
20-49 years	-3545	-2062	-2567	150	1524	-6500

As expected, most of the surplus of women leaving New Zealand in the late 1990s and early 2000s were citizens of Asian countries; their larger immigrant flows were matched by larger re-emigrant flows as well (Table 30). In nearly all of the flows of non-New Zealand citizens out of the country after a period of residence of 12 months or more the number of males leaving exceeded the number of females, thus following the pattern of

the immigration flows. These outflows of immigrant men could have contributed to the building up of the female surplus in New Zealand, especially before the mid-1990s.

Table 30: Non-NZ citizen PLT departures aged 20-49 years by region of citizenship

Citizenship	M	F	F-M	F/M
1980-84				
Australia	4711	4757	46	1.01
Pacific Islands	2619	2025	-594	0.77
Asia	2568	1529	-1039	0.60
North America	2191	1500	-691	0.68
Europe	1490	1126	-364	0.76
UK/Ireland	7272	6407	-865	0.88
Other areas	428	390	-38	0.91
Total non-NZ	21279	17734	-3545	0.83
1985-89				
Australia	4339	4320	-19	1.00
Pacific Islands	2191	1958	-233	0.89
Asia	2304	1546	-758	0.67
North America	1955	1594	-361	0.82
Europe	1600	1318	-282	0.82
UK/Ireland	5802	5464	-338	0.94
Other areas	559	488	-71	0.87
Total non-NZ	18750	16688	-2062	0.89
1990-94				
Australia	3251	3332	81	1.02
Pacific Islands	3088	2480	-608	0.80
Asia	5293	4328	-965	0.82
North America	1756	1549	-207	0.88
Europe	1815	1533	-282	0.84
UK/Ireland	5159	4692	-467	0.91
Other areas	482	363	-119	0.75
Total non-NZ	20844	18277	-2567	0.88
1995-99				
Australia	4206	4522	316	1.08
Pacific Islands	1901	1503	-398	0.79
Asia	6862	7900	1038	1.15
North America	1901	1771	-130	0.93
Europe	1643	1608	-35	0.98
UK/Ireland	5488	4952	-536	0.90
Other areas	864	559	-305	0.65
Total non-NZ	22865	22815	-50	1.00
2000-04				
Australia	4088	4644	556	1.14
Pacific Islands	1535	1313	-222	0.86

Asia	9399	10688	1289	1.14
North America	2142	2026	-116	0.95
Europe	2095	2264	169	1.08
UK/Ireland	6490	6516	26	1.00
Other areas	990	812	-178	0.82
Total non-NZ	26739	28263	1524	1.06

Over the 25 years, almost 215,000 non-New Zealand citizen PLT departures aged 20-49 years were recorded – 110,277 males and 103,777 females (Table 31). The surplus of males over females in the departure flow was only 6,500 – hardly evidence of a major sex imbalance in the departure flows, especially when there was a similar imbalance in the non-New Zealand citizen arrival flows over the same period (Table 25).

Table 31: Non-New Zealand citizen PLT departures, 1980-2004 (June years)

Age group	**1980-2004**			
	M	**F**	**F-M**	**F/M**
Under 5 Years	8072	7646	-426	0.95
5 - 9 Years	9097	8497	-600	0.93
10 - 14 Years	8501	7992	-509	0.94
15 - 19 Years	12877	14728	1851	1.14
20 - 24 Years	26971	26371	-600	0.98
25 - 29 Years	27205	27293	88	1.00
30 - 34 Years	21109	20276	-833	0.96
35 - 39 Years	15677	13898	-1779	0.89
40 - 44 Years	11495	9471	-2024	0.82
45 - 49 Years	7820	6468	-1352	0.83
50 - 54 Years	5547	4992	-555	0.90
55 - 59 Years	3964	3991	27	1.01
60 - 64 Years	2890	3507	617	1.21
65 - 69 Years	2492	2799	307	1.12
70 - 74 Years	1623	1992	369	1.23
75 Years and Over	1366	2119	753	1.55
Total	166706	162040	-4666	0.97
20-49 years	110277	103777	-6500	0.94

The overall net migration gains from the non-New Zealand citizen PLT flows into and out of the country between 1980 and 2005 are summarized in Table 32. It is here that we can see some significant surpluses of females over males, especially in the age groups 20-24 (4,110; sex ratio 1.15) and 25-29 years (5,435; sex ratio 1.18). However, the surpluses of males over females in the 30-49 year age groups more than compensate for female surpluses, giving an overall shortfall of just over 3000 women by comparison with men aged 20-49 years for the period as a whole (Table 32).

Table 32: Non-New Zealand citizen PLT net migration, 1980-2004 (June years)

Age group	M	F	F-M	F/M
Under 5 Years	26368	24132	-2236	0.92
5 - 9 Years	22488	20548	-1940	0.91
10 - 14 Years	22240	20075	-2165	0.90
15 - 19 Years	42371	38256	-4115	0.90
20 - 24 Years	27661	31771	4110	1.15
25 - 29 Years	30738	36173	5435	1.18
30 - 34 Years	29233	28472	-761	0.97
35 - 39 Years	25085	22485	-2600	0.90
40 - 44 Years	20104	15638	-4466	0.78
45 - 49 Years	12659	7902	-4757	0.62
50 - 54 Years	6096	3937	-2159	0.65
55 - 59 Years	3591	3138	-453	0.87
60 - 64 Years	3026	2819	-207	0.93
65 - 69 Years	2185	2062	-123	0.94
70 - 74 Years	1078	1126	48	1.04
75 Years and Over	885	1253	368	1.42
Total	275808	259787	-16021	0.94
20-49 years	145480	142441	-3039	0.98

In recent years, as noted earlier, an overall surplus of females over males in the age group 20-49 years has emerged in the non-New Zealand citizen arrival and departure flows over the past decade. The net migration gains between 1995-2004 are summarized in Table 33, and it can be seen that the overall surplus of females over males in the age group was just under 2,500. Actual surpluses were found in three age groups: 20-24 (2,367; sex ratio of 1.12); 25-29 (4,982; sex ratio of 1.24) and 30-34 years (714; sex ratio of 1.04). There was also evidence of quite significant convergence in numbers of males and females aged 35-39 years – the sex ratio for this age group was 0.96 for the flows between 1995 and 2004, compared with 0.90 for the flows over the 25 year period (Tables 32 and 33).

Table 33: Non-New Zealand citizen PLT net migration, 1995-2004 (June years)

Age group	M	F	F-M	F/M
Under 5 Years	14018	12790	-1228	0.91
5 - 9 Years	14356	13101	-1255	0.91
10 - 14 Years	14467	12942	-1525	0.89
15 - 19 Years	29023	25936	-3087	0.89
20 - 24 Years	20177	22544	2367	1.12
25 - 29 Years	20760	25742	4982	1.24
30 - 34 Years	19603	20317	714	1.04
35 - 39 Years	16573	15902	-671	0.96
40 - 44 Years	13722	11542	-2180	0.84
45 - 49 Years	8929	6135	-2794	0.69
50 - 54 Years	4460	3203	-1257	0.72
55 - 59 Years	2722	2436	-286	0.89
60 - 64 Years	2307	2111	-196	0.92
65 - 69 Years	1569	1406	-163	0.90
70 - 74 Years	823	686	-137	0.83
75 Years and Over	614	769	155	1.25
Total	184123	177562	-6561	0.96
20-49 years	99764	102182	2418	1.02

When the net gains in the 20-49 year age group are examined for the major source regions one region stands out as contributing most of the surplus of women during the decade and that is Asia (Table 34). In fact there was a larger surplus of Asian citizen women (3,700) in the age group than for the non-New Zealand citizen net gains (2,418) in total. The Asian gain is especially noticeable in the age group 25-29 years where a surplus of 4,4240 (sex ratio of 1.43) was found.

The 2001 Census of Population and Dwellings revealed that there were some significant female surpluses in the Asia ethnic population, especially those in their late 20s and early 30s. Obviously migration has contributed to the building up of these surpluses, both through the immigration of more women than men in some age groups, as well as the emigration of more of the men, relative to the women, both in the New Zealand citizen as well as the non-New Zealand citizen flows.

Table 34: Asian citizen PLT net migration, 1995-2004 (June years)

Age group	M	F	F-M	F/M
Under 5 Years	5204	4716	-488	0.91
5 - 9 Years	6956	6196	-760	0.89
10 - 14 Years	8090	7247	-843	0.90
15 - 19 Years	20621	18179	-2442	0.88
20 - 24 Years	13676	14131	455	1.03
25 - 29 Years	9824	14064	4240	1.43
30 - 34 Years	10066	11005	939	1.09
35 - 39 Years	8162	8246	84	1.01
40 - 44 Years	6936	6298	-638	0.91
45 - 49 Years	4953	3573	-1380	0.72
50 - 54 Years	2348	1789	-559	0.76
55 - 59 Years	1470	1528	58	1.04
60 - 64 Years	1489	1260	-229	0.85
65 - 69 Years	920	704	-216	0.77
70 - 74 Years	436	307	-129	0.70
75 Years and Over	253	264	11	1.04
Total	101404	99507	-1897	0.98
20-49 years	53,617	57,317	3700	1.07

The data presented in this preliminary analysis of the age and gender characteristics of the PLT arrival and departure flows provides some evidence of both a female bias in some of the more recent immigrant flows, and a male bias in some of the emigrant flows, including those for New Zealand citizens. However, there are no very obvious, simple "migration" answers to the sex ratio conundrum in New Zealand's population aged 20-49 years. Rather, there are several small contributions made by population flows between New Zealand and its major migrant source regions, as well as the flows of New Zealanders themselves.

Summary of migration flows

In drawing this preliminary analysis of the migration flow data to a close it is useful to focus attention on the net gains and losses to New Zealand's population through PLT migration over two periods: between 1 July 1991 and 30 June 1996 (essentially spanning the intercensal period between the 1991 and 1996 censuses) and the period between 1 July 1996 and 20 June 2001. When the data for the New Zealand citizen and the non-New Zealand citizen flows are aggregated for the two intercensal periods, there is evidence of two contradictory trends contributing to the widening gap in numbers of males and females aged between 20 and 49 years. In the early 1990s a small surplus of women in the overall net gains between 1991 and 1996 augmented a little the growing female surplus in the resident population. In the late 1990s, net losses rather than net

gains were found for the population aged 20-49 years, and a significantly greater net loss of males contributed to the growing male deficit in the resident population.

It will be recalled that there was an increase by 17,172 in the surplus of females over males aged 20-49 years between the 1991 and 1996 censuses. Between 1 July 1991 and 30 June 1996 PLT net migration added 20,280 males and 21,936 females in this age group – only 1,756 more females than males. This surplus of females only accounts for the equivalent of 10 percent of the 17,172 increase in the female surplus in this age group between the two censuses.

Between the 1996 and 2001 censuses the gap between the number of males and females aged 20-49 years increased by a further 22,869. During the late 1990s there were actually PLT net losses in both sexes in the age group 20-49 years – a loss of 17,374 males and 8,081 females. The much larger net loss of males (9,293 more than the loss of females) would have contributed to enlarging the gap between sexes – it is equivalent to just over 40 percent of the total increase in the male deficit during the intercensal period.

These summary findings reinforce arguments for always examining the flows of New Zealand citizens, as well as those of immigrants, when examining the impact of international migration on New Zealand's resident population. The complex interplay of flows in the citizen and non-citizen populations means that there is rarely a simple "migration" answer to a population-related question. This applies to the interesting question of the widening gap between numbers of males and females in New Zealand's resident population aged 20-49 years over the past 20 years. Different combinations of immigration and emigration have made variable contributions to the increasing female surplus/male deficit in this age group, and migration is only one of a number of factors contributing to this distinguishing feature of New Zealand's contemporary demography.

What can small-scale longitudinal studies tell us about gendered migration?

The Dunedin longitudinal survey tracks a cohort of people who were born at Dunedin's Queen Mary's Hospital between April 1972 and March 1973. Assessments have taken place at birth, three years, every two years until age 15 and at 18, 21 and 26. Assessment has taken place in 2005 for the participants' 32nd birthdays. A study based on data collected at age 26 shows that amongst this group there has been gendered migration with significantly more men than women overseas (Table 35). While based on a very small sample, this supports the overall view that outward migration of New Zealand born men has been a contributing reason behind the change in New Zealand sex ratios among young adults.

Table 35: Birth ratios and ratios of respondents in the Dunedin longitudinal survey by location

	In New Zealand				Outside of New Zealand			
	Males	Females	Total	Ratio	Males	Females	Total	Ratio
Birth	527	510	1,037	0.97	0	0	0	
Migration between 18-26 years	335	335	670	1.00	139	113	252	0.81

Source: Milne (2001)

Skilled migration and gender

In many countries there is concern about the loss of skills through migration (e.g. Dumont and Lemaître 2004). Glass and Choy (2001) have examined the New Zealand 'brain drain'. They concluded that, overall, there was a 'brain swap' rather than a 'drain" (Table 36). Glass and Choy also argue that controlling for changes in age distribution of the remaining population, age specific emigration rates indicate that New Zealanders are delaying their departures until older ages. This suggests that increasing New Zealanders are gaining tertiary education before leaving New Zealand.

Table 36: Long term skill flows in New Zealand

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

Source: Glass and Choy (2001)
* excludes Australia

Unfortunately, most studies of "brain drains' do not consider gender. Student loan data is a relatively new data source and potentially provides some insight into the gendered nature of skilled migration. Table 37 provides cross sectional data from 2001.

Table 37: Sex ratios for New Zealanders with student loans by whether they were in New Zealand or living overseas, 2001 academic year

		Ratio of women to men					Number				
		Age					Age				
Location specified	Highest qualification	20-29	30-39	40-49	50+	Total*	20-29	30-39	40-49	50+	Total *
Overseas	Bachelors	1.48	0.94	1.50	-	1.41	3,681	471	105	-	4,284
	Certificate	1.40	1.00	1.67	-	1.35	699	216	96	-	1,074
	Diploma	1.95	1.46	1.00	-	1.83	531	93	42	-	687
	Post Graduate	1.08	0.63	0.41	-	0.92	1,011	312	72	-	1,410
	Not specified	1.25	1.50	-	-	1.50	27	15	-	-	45
	Total	1.43	0.88	1.12	-	1.32	5,949	1,104	315	-	7,503
In NZ	Bachelors	1.47	1.54	2.57	2.22	1.56	31,605	7,182	3,516	1,014	43,449
	Certificate	1.10	1.44	1.81	1.55	1.25	22,725	9,597	4,965	1,872	47,337
	Diploma	1.58	1.74	2.40	2.28	1.78	8,004	3,708	2,235	705	16,134
	Post Graduate	1.14	0.79	1.12	1.24	1.04	7,557	3,135	1,470	468	12,636
	Not specified	1.52	1.13	1.44	1.67	1.35	171	93	69	24	363
	Total	1.31	1.39	1.96	1.75	1.39	70,065	23,718	12,252	4,083	119,916
% of total overseas							8.5	4.7	2.6		6.3

* Including under 20 year olds who are not shown in this table due to small numbers.
Note: Ministry of Education supplied qualifications may not be complete. In particular, no completions data are available prior to 1997. Numbers are not shown in the 50 and over age groups for those overseas due to small numbers. All numbers are rounded to 3. Finally, not all those qualified New Zealanders living overseas or in New Zealand will have a student loan.
Source: Statistics New Zealand

Table 37 shows sex ratios by age, gender and location for those New Zealanders with a student loan who obtained a qualification in the period 1997-2001. In all qualification categories in the 20-29 age group there were more women than men both in New Zealand and overseas. In the 30-39 age group, in 2001 there were overall significantly more men with student loans overseas than women, particularly those with postgraduate qualifications. However, this reverses again in the 40-49 age group with more women than men overseas (although there were relatively small numbers of either women or men overseas and with a student loan in this age group). Finally, the data show in all age groups the vast majority of New Zealanders with student loans lived in New Zealand. In 2001, the overall ratio of women to men with a student loan was 1.39 (that is, at this time 39 percent more women than men had a student loan, though this may be influenced by differences in the rates at which loans to men and women are repaid).

While the results should be treated with some caution, the data lend some support to the idea that well-qualified men in their prime couple forming age group (30-39) are overseas in greater numbers than well-qualified women in the same age group. These data suggest that migration, as well as participation differences, may be influencing the imbalances in sex ratios for those in New Zealand who hold tertiary qualifications.

Part 2: The effect of changes in sex ratios on the 'marriage market', fertility and employment

Introduction

Changes in the relative number of women and men in prime couple forming age groups may not only affect the gender mix in the labour market but may also affect 'marriage markets'[9]. In turn, changes in the marriage market may affect fertility as well as the employment of women and, to a lesser degree, men.

After briefly considering some theory, in this part of the paper, some empirical evidence is presented on possible relationships between 'marriage markets', fertility, and employment.[10] These are complex areas of human behaviour and the studies cited only scratch the surface of possible associations or causal relationships.

The analysis is based on New Zealand data on fertility, employment and outcomes in the marriage market. These are primarily drawn from the census so are cross sectional. No attempt is made to try and assess any causation between the various sets of variables but some broad associations are considered.

While the main focus is on how changing sex ratios might affect the marriage market some consideration is given to how the marriage market might itself be changing sex ratios. As an example, data are presented on the number of New Zealand born men with an overseas born partner relative to New Zealand born women having an overseas born partner.

Finally, an overall assessment is made of how likely it is that changing sex ratios are leading to changes in the marriage market, fertility and, ultimately, the labour market.

Theories and research evidence with regard to changes in sex ratios, marriage markets and fertility

Much has been written about the possible effect of uneven sex ratios on behaviour in marriage markets, employment and fertility. Some of this literature focuses on absolute ratios, while other research focuses on the influence of ratios of women to 'economically viable' men (including education based ratios).

[9] This section is based on the assumption, if they are seeking a relationship, most men and women are seeking a heterosexual relationship. While many overseas studies focus primarily on legal marriage, all the New Zealand data on couples includes both legally married and defacto couples.

[10] A parallel working paper is available on theories as to how changes in sex ratios might influence marriage market, fertility and employment (Callister 2006).

Overall, in relation to situations where there is an excess of women, the theory, as well as some of the evidence, suggests:

- Women will be less likely to live in opposite sex couple households
- For those women forming couples, a greater proportion will 'marry down" in relation to their partners education and/or employment prospects
- While this will result in an overall reduction in fertility, depending on changes taking place in education for women and labour participation, as well as the support given to sole parents by the state, a greater number of women will have children on their own
- An excess of women relative to men will also lead to higher employment rates for women as well as more women working in managerial/professional occupations.

Testing these hypothesises is not straightforward as the anticipated changes in behaviour are inevitably set against wider social, cultural and economic changes taking place in society.

New Zealand evidence

To reset the scene in terms of sex ratios and what they mean in actual numbers, Table 38 shows estimates for June 2005. As already discussed, apart from the 20-24 age group, these ratios are not significantly different from the census data from 2001.

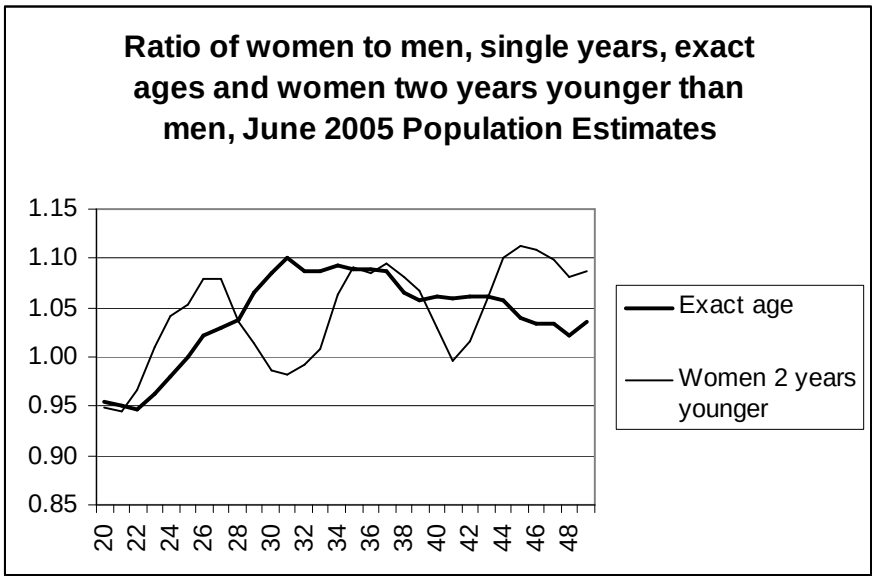
Table 38: Number of 'excess' women relative to men, Population Estimates June 2005

Age	Ratio of women to men	Number of excess women
20-24	0.96	-6,100
25-29	1.03	3,820
30-34	1.09	12,570
35-39	1.08	11,310
40-44	1.06	9,280
45-49	1.03	4,620
Total		35,500

Source: Estiamted Resident Population estimates, Statistics New Zealand

Like other countries, in New Zealand men tend to be, on average, older than their partners. In New Zealand, the age gap is just under two years (Statistics New Zealand 2004). Figure 4 shows sex ratios based on this two-year gap. It indicates that in some single years there is not a shortage of men. But when considering marriage markets, using single years will be misleading. The five-year age groups shown in the previous table are probably more useful.

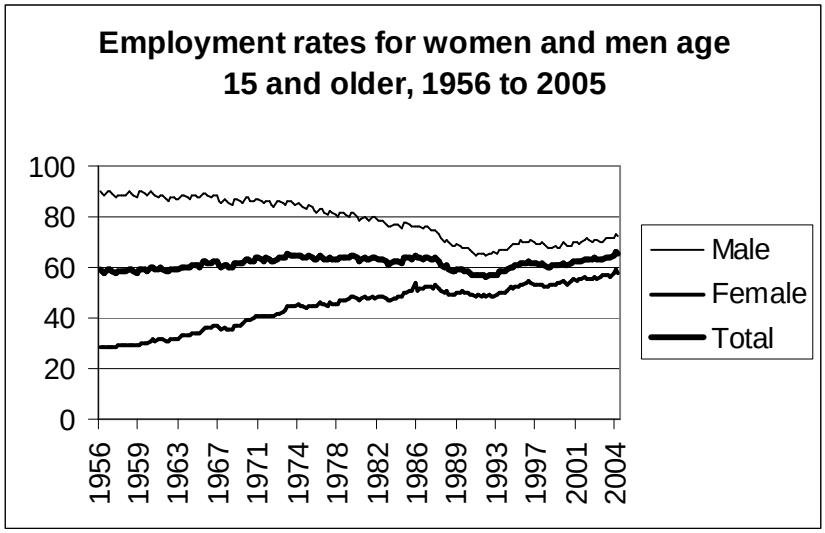
Figure 4



Source: Census, Statistics New Zealand

As also discussed, while absolute numbers may be important, numbers of employed men relative to women may be more important. Figure 5 shows long-term employment trends for women and men. While some of the early decline in the employment of men was due to early retirement, the later decline affected men in the prime earning and family formation age group of 20-49. These changes alone potentially have had the potential to have a major impact on marriage markets before absolute sex ratios are considered.

Figure 5



Source: Derived from Chapple (1994) and Household Labour Force Survey

Of more direct relevance to theories of changing employment affecting marriage markets, Table 39 uses data from the 1976 through to 2001 censuses and shows full-time employment rates for men in the main couple forming age groups. It shows a major decline in full-time employment in most age groups. The most dramatic decline in many of the age groups was between the 1986 and 1991 censuses, a five year period in which the economy went into a major recession.

As an example of how to read the table, for those men born in 1952 to 1956 who were 20-24 at the time of the 1976 census 83% worked full time. However, reading across the table for 20-24 year olds of those men born in 1967-71 who were 20-24 in 1991 only 64% worked full-time. Equally, 95% of those men born in 1947 to 1951 who were 30-34 at the time of the 1981 census worked full time, whereas by 2001 only 81% of this age group worked full time. In this table the major decline in each age group was between the 1986 census and the 1991 census (from 47% to 27% for men aged 15-19, from 81% to 64% for men aged 20-24, from 88% to 75% for men aged 25-29, from 90% to 80% for men aged 30-34 and from 92% to 82% for men aged 35-39).

Table 39: Full-employment rates for men aged 15-49 in each birth cohort, New Zealand born residents only

Age group	Birth cohort							
	1947-51	1952-56	1957-61	1962-66	1967-71	1972-76	1977-81	1982-86
15-19			50	50	47	27	27	26*
20-24		83	85	81	64	66	64*	
25-29	91	92	88	75	78	77*		
30-34	95	90	80	81	81*			
35-39	92	82	82	82*				
40-44	84	83	83*					
45-49	83	83*						

Source: Census, Statistics New Zealand
Note: 2001 full time employment rates are followed by an asterisk.

While for a small group of men, the longer term decline in full-time employment will have been a positive trend reflecting greater choices to study, look after children or work part time, for the majority of men it will represent restriction in opportunities for employment, often through the lack of suitable skills. Despite strong overall employment growth between 1991 and 2001 full-time employment rates for men in all age groups under age 50 did not increase or the increase was very minor.

The loss of employment of men, particularly post 1986, led to changing employment ratios. Between 1986 and the mid 1990s in all age groups, but particularly those aged 25-29 and 55-59, there was a major decline in this ratio (Callister 2000). Table 40 shows this ratio in 2001. It indicates that in key couple forming age groups the number of "economically viable" men (as crudely measured by employment status) was far lower than the total number of women in each age group.

Table 40: Total number of women relative to the total number of men who were employed, 2001

	20-24	25-29	30-34	35-39	40-44	45-49
Ratio of women to employed men	1.45	1.35	1.33	1.27	1.23	1.20
Total ratio of women to men (census data)	1.02	1.09	1.11	1.08	1.06	1.04

Source: Census, Statistics New Zealand

As a first test of whether changes in either employment or absolute sex ratios might have been associated with changes in marriage rates, Table 41 shows changes in marriage rates for women born in the cohorts 1947-51 through to 1982-86. When looking across age groups marriage rates have been steadily declining between all the censuses. As an example, women born in 1947-51 who were 25-29 at the 1976 census 83% were married. But by the 2001 census of those who were 25-29 (born in 1972 to 1976) only 31% were legally married.

However, the decline started well before the major changes in either absolute or employment related sex ratios. This suggests other factors were driving down marriage rates in this earlier period and may well have been important drivers of change in the later period.

Table 41: Marriage rates for women aged 15-49 in each birth cohort, New Zealand born residents only[11]

	1947-51	1952-56	1957-61	1962-66	1967-71	1972-76	1977-81	1982-86
15-19			8	3	1	1	0	0*
20-24		60	44	30	18	12	8*	
25-29	83	73	61	50	39	31*		
30-34	80	73	64	57	49*			
35-39	76	70	65	57*				
40-44	72	69	62*					
45-49	71	65*						

Source: Census, Statistics New Zealand
Note: 2001 marriage rates are followed by an asterisk.

Further complicating this analysis, many New Zealanders do not legally marry. Other living arrangements therefore need to be considered. The 1976 and 1981 censuses do not have a good measure of living arrangement. Therefore only data from 1986 through to 2001 are shown. A number of living arrangements are possible including living in a non-private dwelling or, if in a private dwelling, living as a couple (with or without children), living as a sole parent, living on ones own and living in an extended family household. The following table shows only those New Zealand born residents living on their own and those living as couples.

[11] The changes in patterns of marriage for men are broadly similar.

Table 42 shows that in all the five year age groups between 20-49 more men than women live on their own. This is primarily because if a women lives without another adult, the other main living arrangement is sole parent. The table also indicates that across the same age groups an increasing proportion of New Zealanders are living on their own.

Table 42: Percentage of New Zealand born females living alone, 1986 to 2001

	Women				Men			
	1986	1991	1996	2001	1986	1991	1996	2001
20-24	3	3	2	3	5	4	3	4
25-29	3	3	3	5	7	8	6	7
30-34	3	4	4	5	7	8	8	9
35-39	3	4	4	5	6	8	8	10
40-44	4	4	5	6	6	7	8	10
45-49	5	6	7	8	7	8	8	10

Source: Census, Statistics New Zealand

If people are living alone they generally either have to financially support themselves, generally through the labour market, or are supported by government transfers. In general, at a time of increasing education for women and a strong labour market, more women living alone will result in a greater proportion of women being in the labour market.

Not surprisingly, Table 43 shows that in most age groups there has been a decline in the proportion of men and women living in couples. The largest decline over this period was in younger women living in couples down from 42 percent in 1986 to 29 percent in 2001. So not only are New Zealand born residents less likely to marry, they are also less likely to live in couple households. Alongside the census data on the proportion of New Zealand born residents are the changing sex ratios from 1986 through to 2001 (based on census data and for all New Zealanders not just those born in the country). When the data from this short time period are considered, the decline in the number of people living in couples does occur at a time when sex ratios were changing. But large declines were already occurring when sex ratios were not particularly uneven.

Table 43: Percentage of New Zealand born males and females living in a couple household, 1986 to 2001

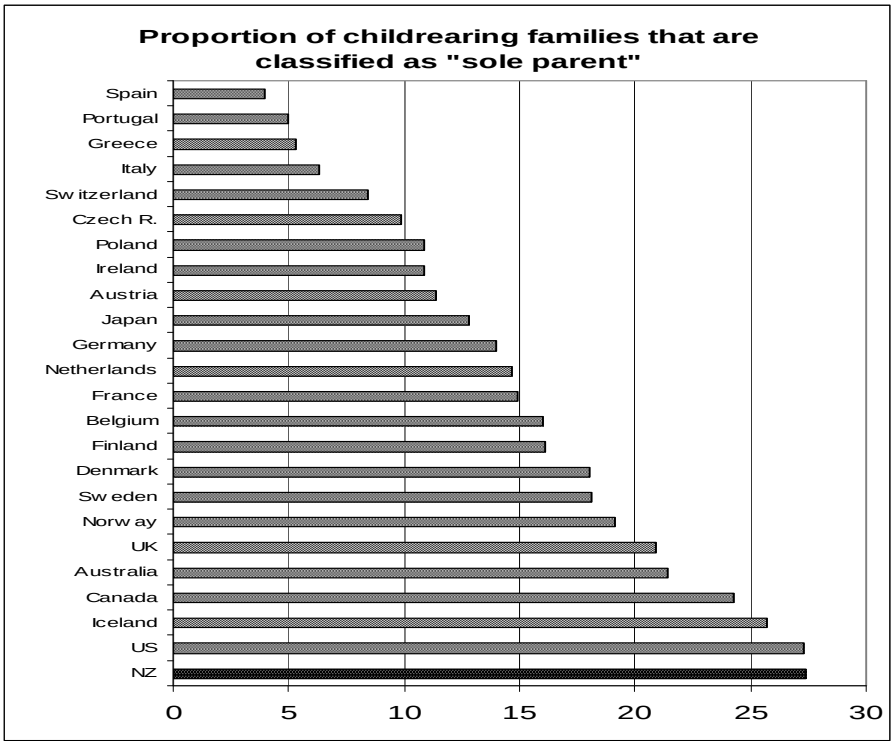
	Females				Males				Sex ratios			
	1986	1991	1996	2001	1986	1991	1996	2001	1986	1991	1996	2001
20-24	42	35	34	29	23	20	22	20	0.98	0.99	1.02	1.02
25-29	69	62	59	52	59	51	50	45	1.01	1.05	1.06	1.09
30-34	78	72	69	63	76	69	67	59	1.02	1.04	1.06	1.11
35-39	81	76	73	67	81	76	74	66	1.00	1.02	1.05	1.08
40-44	81	77	75	69	83	79	77	69	0.99	1.01	1.03	1.06
45-49	80	77	76	69	83	80	79	71	0.99	0.99	1.01	1.04

Source: Census, Statistics New Zealand

In addition, the shortage of men should have been having a greater effect on the data for women than for men but in most age groups the decline was for both men and women.[12] This would suggest that while the absolute sex ratio changes may have been having some small effect, overall other factors were strongly influencing the decline in the proportion of people living in couples. If changes in sex ratios were having any real impact, the influence was probably stronger from changing employment and/or education sex ratios.

As already noted, for women a common living arrangement that is neither classified as living alone or living in a couple is that of sole parenthood. Alongside the US, New Zealand stands out in the OECD in terms of the proportion of sole parent families (Johnston 2005) (Figure 6).

Figure 6



Source: Johnston (2005)

Determining the causes in the growth of sole parenthood (mainly sole mothers) is extremely difficult.[13] As has always happened to some extent, increasingly women are choosing to have children on their own.[14] But many enter this state through a relationship break-up.

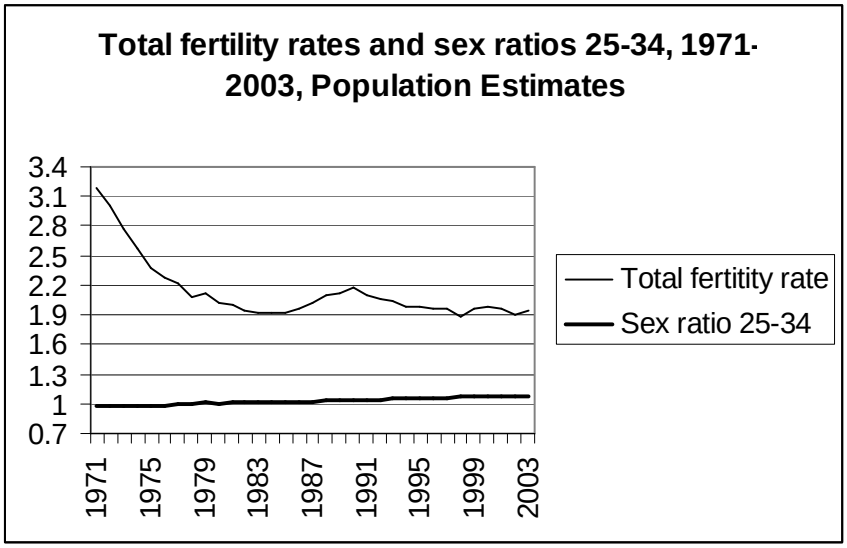
[12] Unless men feel they have less reason to form a couple if there is a surplus of women.
[13] This term, 'sole parent', is, of course problematic as Birks (2001) has pointed out, as for many of these "sole parent" households the children will in fact have two living biological parents, though not necessarily in the same household. There may also be other adults acting in parental roles to the child.
[14] For example see http://mattes.home.pipeline.com/

Overall the various sex ratio measures (absolute numbers, employment and education ratios) suggest that a significant group of single women, including sole mothers seeking a new partner, should they have been seeking a heterosexual partnership and if they were also seeking economic resources, would have faced major difficulties in finding a New Zealand partner from within their broad age group. Certainly, an excess of women based on the employment ratio would render US policies of trying to 'marry' sole mothers to move them out of poverty extremely difficult in New Zealand.

However, while there is a possibility that changing sex ratios may have contributed in some small way to the increasing number of sole mothers in New Zealand, it may also be that a rise of sole parenthood could contribute to changing sex ratios. If, for a variety of reasons, many of the separated men have little contact with their children, then they may be more geographically mobile, including internationally, than are fathers living in intact couple families.

New Zealand data can also be used to see if (visually) there is any relationship between changing sex ratios and fertility. Figure 7 shows patterns of total fertility and sex ratios in the 25-34 age group from 1971 through to 2003. The large decline in fertility in the initial period took place when sex ratios were nearly even. Then the misnamed 'baby blip" occurred when ratios were rising. Finally fertility rates have somewhat flattened as ratios continued to rise. Figure 7 further cautions against any relationships being assumed to exist between changing sex ratios and changing fertility.

Figure 7



Source: Statistics New Zealand

Have New Zealand men marrying overseas born women contributed the sex ratio imbalance?

It is possible that the workings of the marriage market could itself be having an influence on sex ratios. For example, if New Zealand men on their "OE" were more likely to return with an overseas partner than were New Zealand women, this would have some influence on sex ratios. Again, census data can be used to partly explore whether this might be taking place. Table 44 uses 2001 census data to show first, the proportion of New Zealand born males and females with an overseas born partner, then the proportion of overseas born males and females with a New Zealand born partner. In this initial table, no information is presented on how long the overseas born person had been in New Zealand

The first set of data shows virtually no difference between New Zealand born men and women in terms of the proportion who had an overseas born partner. This suggests that New Zealand men bringing 'home' overseas partners is not a factor in changing sex ratios.

The differences between women and men in terms of the proportion of overseas born with a New Zealand partner are slightly larger, but the differences are not great. In addition, in the key age groups of 20-34 it is overall men rather than women who are more likely to have a New Zealand born partner. Again, this undermines theories of the marriage market itself contributing to changes in sex ratios.

Table 44: 'Marriage' by New Zealand born to overseas born New Zealand residents, 2001

	Age of target person					
	20-24	25-29	30-34	35-39	40-44	45-49
% of New Zealand born males with a New Zealand born female	91	90	88	88	88	88
% of New Zealand born females with a New Zealand born male	91	89	87	87	88	89
% overseas born males with a New Zealand born female	49	44	39	34	34	35
% overseas born females with a New Zealand born male	43	41	37	34	37	39

Note: In this table 'marriage' includes both formal and informal marriage
Source: Census, Statistics New Zealand

Information is available on where a person was in the previous census, that is five years before a particular census. Table 45 shows New Zealand born males in the 30-34 age group living in a couple in 2001 by where they and their partner were in 1996. The table shows the majority were both in New Zealand.

Table 45: New Zealand born male (aged 30-34), overseas born female by where both were five years previously, 2001

Total	Both overseas 5 years ago	Male overseas	Female overseas	Both in New Zealand
6,807	1,053	93	993	4,671

Source: Census, Statistics New Zealand

However, one specific area where it is possible that there is some gendered migration via the marriage market is New Zealand non-Asian men marrying Asian brides. When total count ethnic intermarriage data are considered, they show that just 9 percent of Asian men in New Zealand have a partner recording a European ethnicity. For Asian women the figure is 20 percent (Callister, Didham and Potter 2005). This can be seen even more clearly when examining the ethnic groups of the partners of Filipino men and women (who are mainly born overseas).

In 2001, 63 percent of Filipino women had a partner recording European ethnicity, whereas only 7 percent of Filipino men had a partner recording a European group.[15] However, while these ethnic and gender differences are significant when the actual numbers of partnerships with a non-Asian man and an Asian women are considered, they only represent just over 8,000 couples out of a total 730,000 opposite sex couples in 2001 (just over 1%). Therefore, by themselves, such marriages will have had little effect on total sex ratios. Overall, all these data suggest that the marriage market itself has had little impact on changing sex ratios

Education, the marriage market and fertility

As discussed earlier, historically women have tended to "marry up" educationally. This might suggest that it would be the well-educated women who find it most difficult to attract a partner. The following two tables simply show the relationship between qualifications and living arrangement for women in 2001. Two measures of being 'single' are shown. The first measure shows the proportion of women who did not have a partner. They could live on their own, could live with another unrelated adult or could live in a multi-person household, such as being part of a flatting situation. These women could also have a dependent child.

The second measure is a narrower concept of being single. The women are those who are recorded as not having a partner (again they could live on their own or with other adults) but they also do not have a child.

Other definitions could also be used. For example, only those women living on their own could be considered and, as a further restriction, these women would have to record not having a partner (who would live in another household). These additional data are not shown.

[15] Some of these people will be recording more than one ethnic group.

Using the first definition, Table 46 shows the proportion of women in each highest qualification group who did not have a partner in 2001.[16] The age groups start at 25 given that many women under this age do not have long-term partners and that many have yet to complete formal education.

Table 46 shows that in the younger age groups (25 through to 39) it is women with no formal qualifications who are the least likely to have a partner. If uneven sex ratios have been having an effect on the marriage market, these data would suggest it might be that the least educated, not the most educated, women that have had the most difficulty in finding a partner.

Table 46: Percentage of women in each highest qualification group who did not have a partner, 2001

	25-29	30-34	35-39	40-44	45-49
No Qualification	51	41	38	33	28
School	37	26	23	22	22
Vocational	40	29	26	24	24
Bachelor Degree or Higher	43	28	23	24	25

Source: Census, Statistics New Zealand

Table 47 uses the second definition of being single and considers the proportion of unpartnered women excluding those who had a dependent child living with them.[17] It may be that sex ratios have little effect on having a child simply because women in New Zealand can still have children without a permanent partner (so, effectively a number of men have children across more than one family – the informal polygamy described in the United States). Certainly like the US, New Zealand is still at the high end internationally for total fertility rates.

Table 47 shows that in the younger age groups it is well educated women who are truly 'single'. In the older age groups there is little difference. The key difference between Tables 46 and 47 is that poorly educated women are more likely to have a child.

Table 47: Percentage of women in each highest qualification group living with neither a partner nor a child, 2001

	25-29	30-34	35-39	40-44	45-49
No Qualification	21	14	13	13	15
School	24	14	10	9	11
Vocational	30	17	11	10	12
Bachelor Degree or Higher	41	24	15	13	14

Source: Census, Statistics New Zealand

[16] This is based on marital status. So the couples do not necessarily live together in the same household.
[17] This table mixes marital status data and family data. Although an attempt was made by Statistics New Zealand to ensure there is no overlap in the data, it should nevertheless be treated with some caution.

As an example drawn from Tables 46 and 47, of those women aged 25-29 with no formal qualification 51% were unpartnered, but only 21% were either unpartnered or did not have a child (that is, around 30% had a child and were living as a 'sole parent').[18] In contrast, for women in this age group with a degree or higher only about 2% had a child on their own. Overall, particularly in the 30 plus age groups, Table 47 suggests that relatively few women in each qualification group are either unpartnered or, did not have a child. However, for poorly qualified women it is more likely they will be parenting a child on their own.

Yet, these data do not indicate how many children women are having. It may be that women who are long-term unpartnered, even if they have children, have fewer children than partnered women. Fully understanding the effect of changes in sex ratios on couple formation and fertility clearly requires more complex longitudinal data.

It is also possible that given an apparent excess of women, particularly well qualified women, more female same-sex couples will form. Long term data on the number of same sex couples in New Zealand are not available and even 2001 census data are considered unreliable. However, based on these potentially unreliable 2001 data, there were very few same-sex couples in 2001 (Table 48). But these data do indicate that there were more women than men living in such couples. However, it is highly unlikely same sex living has anything to do with changing sex ratios. It is far more likely related to changing social norms and data quality issues.

Table 48: Number of men and women living in a same sex couple, 2001

	Males	Females	Ratio of women to men
20-24	102	177	1.7
25-29	183	204	1.1
30-34	252	366	1.5
35-39	342	441	1.3
40-44	357	420	1.2
45-49	261	402	1.5

Source: Census, Statistics New Zealand

If there was any significant growth in female same sex couples, each partner in these couples would still need to have at least two children each to support fertility levels. So there would be a need to have at least four children as a couple. If more same sex couples did form as a result of a shortage of men, this is likely to reduce fertility levels.

Finally, this section examines changes in high-level educational qualifications within opposite sex couples aged 25-34.[19] There are some problems with changes in educational questions between censuses, so only the extremes of education, those with a degree or

[18] The other parent may, however, have been involved in the child's upbringing.
[19] In this calculation both partners have to be within the 25-34 age range.

higher qualification and those with no qualifications are chosen as the main groups. The remaining group is a residual. The two extremes seem reasonably comparable over time, whereas there are major problems in the school/other tertiary boundary.

In Table 49 there are two measures shown. The main one is the percentage of couples in each cell. For example, in 1986, only 4 percent of couples in this age group were dual degree (or higher qualification) couples, but by 2001 this had reached nearly 11 percent. The second figure (in brackets) represents a ratio of what the number in the cell was relative to what it should have been had there been random selection of partners. For example, in 1986 there were over five times the number of couples where both had a degree than would have been expected. This ratio reduced to just under three times in 2001. In all the censuses, the number of couples where both had the same level of qualifications was higher than expected given random mating. This confirms the saying "birds of a feather flock together", that is people with similar qualification levels tend to form couples.

Table 49: Highest qualifications of women and men in couples in the 25-34 age group (both age 25-34) - % of couples in each group and ratio of actual outcome to expected given random sorting (in brackets)

1986		Female			
	n= 110,526	Degree or postgraduate	Other tertiary/school	No formal qualification	Total
	Degree or postgraduate	4.2 (5.4)	6.5 (0.9)	0.4 (0.1)	11.1
Male	Other tertiary/school	2.5 (0.6)	44.9 (1.1)	14.5 (0.8)	61.9
	No Qualification	0.2 (0.1)	12.7 (0.7)	14.0 (1.8)	27.0
	Total	7.0	64.1	28.9	100.0

1991		Female			
	n= 108,408	Degree or postgraduate	Other tertiary/school	No formal qualification	Total
	Degree or postgraduate	5.1 (5.0)	6.3 (0.8)	0.2 (0.1)	11.7
Male	Other tertiary/school	3.5 (0.6)	51.2 (1.1)	10.9 (0.8)	65.6
	No Qualification	0.3 (0.1)	12.4 (0.8)	10.1 (2.1)	22.8
	Total	8.8	69.8	21.3	100.0

1996		Female			
	n= 108,237	Degree or postgraduate	Other tertiary/school	No formal qualification	Total
	Degree or postgraduate	7.1 (4.1)	6.5 (0.7)	0.3 (0.1)	13.9
Male	Other tertiary/school	4.9 (0.6)	48.6 (1.1)	9.5 (0.8)	63.1
	No Qualification	0.4 (0.1)	13.0 (0.8)	9.7 (2.2)	23.0
	Total	12.5	68.1	19.5	100.0

2001		Female			
	n= 86,349	Degree or postgraduate	Other tertiary/school	No formal qualification	Total
	Degree or postgraduate	10.7 (2.8)	7.3 (0.6)	0.2 (0.1)	18.2
Male	Other tertiary/school	9.4 (0.7)	50.5 (1.1)	5.7 (0.8)	65.6
	No Qualification	0.6 (0.2)	10.1 (0.9)	5.5 (3.0)	16.2
	Total	20.8	67.9	11.4	100

Source: Census, Statistics New Zealand
Note: Unidentifiable and Not Stated and parents temporarily absent on census night excluded
The overall proportion of women and men aged 25-34 with a degree or higher in 2001 was respectively 18.6% and 16.7%.

The data can be further simplified. Table 50 shows just the proportion of women with a degree or higher qualification with a partner who also had a degree and, at the other extreme, the percentage who had a partner with no formal qualifications. The same data are shown for men. It stands out that in each of the censuses very few well-qualified men or women had a partner with no qualifications.

Table 50 shows that for well qualified women, there has been a reduction in the proportion who have a partner with a degree, for men an increase. When a wider set of qualifications are examined, we can observe a trend of women starting to "marry down" in terms of educational qualifications, whereas through changes in sex ratios and relative levels of qualifications, men now have a better choice in terms of partnering with a well-qualified New Zealand woman. These changes will potentially flow through to decision making in households about who is the primary earner, and who is the main caregiver, if

and when these couples have children. They may also flow though into power relations within couples. For instance it may be that in these couples women have greater earning potential and may be less likely to take a day off work when a child is sick than their partner. This sort of change may mean that work-life balance issues become more important for a group of men.

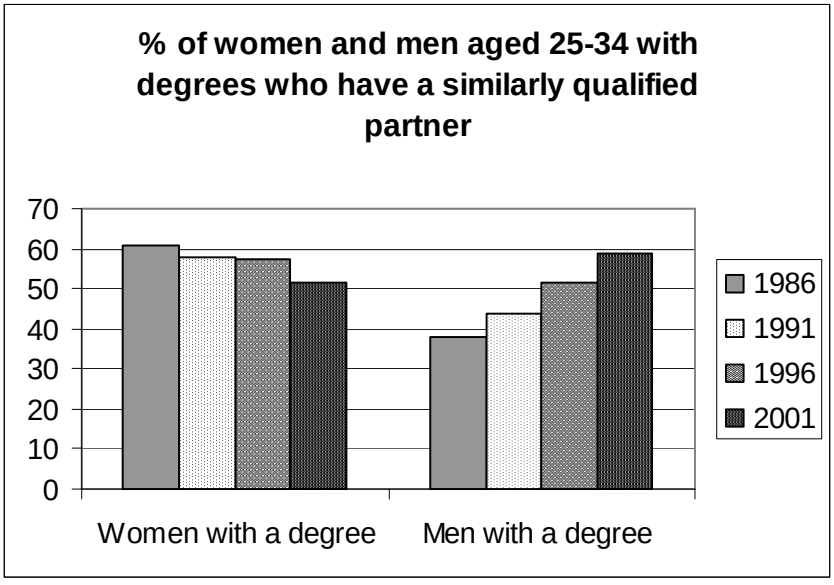
Table 50 : Partners of men and women in couples aged 25-34 who have degrees or higher qualification - % of partners with degrees or higher qualifications and % with no qualifications

	% of partners in qualification group	
	Degree	No qualification
Women with degrees or higher		
1986	60.6	3.1
1991	58.0	2.9
1996	57.3	3.2
2001	51.6	3.0
Men with degrees or higher		
1986	38.0	3.8
1991	43.9	2.1
1996	51.3	2.2
2001	58.9	1.1

Source: Census, Statistics New Zealand

These data are shown graphically in Figure 8 that shows a decline in the proportion of partners of well-educated women also having a degree or higher qualification. The opposite trends apply for well-educated men.

Figure 8



Source: Census, Statistics New Zealand

International sex ratios, fertility and female labour force participation

Finally, Table 51 presents some international data on sex ratios, fertility and female labour force participation. There is no simple relationship between these data. For instance New Zealand has relatively high fertility, but also the highest sex ratio for the 30-34 age group and, apart from Japan, the lowest labour participation rate of women. Japan stands out in having slightly more men than women in the 30-34 age group, but very low fertility and low participation rates. This table suggests that while theory might suggest some linkages between sex ratios, marriage rates, employment of women and fertility there are many other factors that influence decisions in all these important areas of life.

Table 51: Total fertility rate, sex ratios and labour force participation of women in selected industrialised countries

	Total fertility rate (2000)	Sex ratio 30-34 (around 2000)	Labour force participation of women 25-34 (2001)
United States	2.06	0.98	76
New Zealand	1.98	1.09	68
France	1.88	1.00	79
Norway	1.85	0.97	82
Denmark	1.77	0.97	82
Australia	1.76	1.02	71
Finland	1.73	0.96	79
Netherlands	1.72	0.97	80
England and Wales	1.66	*0.96	*75
Sweden	1.55	0.96	82
Switzerland	1.50	1.03	-
Japan	1.36	0.98	65

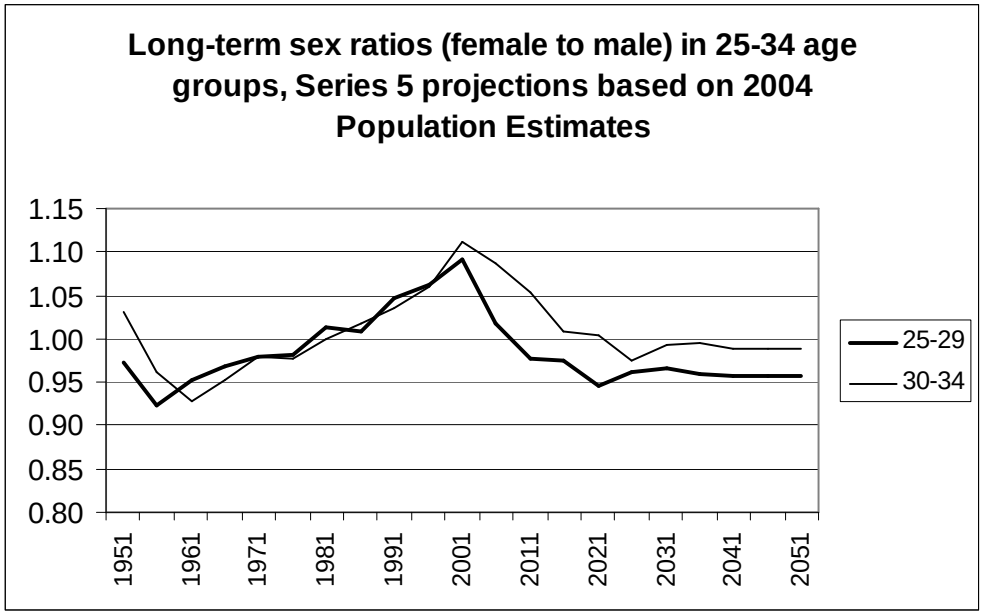
Source: Statistics New Zealand
* UK as a whole

Part 3: Looking ahead

Population projections

Statistics New Zealand regularly develops population projections. It acknowledges there is much uncertainty and so the organisation tends to be conservative in its assumptions. However, given long-term trends in sex ratios, the projections of the numbers of women and men may be unduly conservative in assuming that the current pattern of ratios is somewhat aberrant. Figure 9 shows the projections for those aged 25-29 and 30-34 through to 2051. Also shown are the actual trends from 1951. The projections assume a very rapid reversal of the long-term historical trend.

Figure 9



Source: Statistics New Zealand

It is interesting to speculate on the reasons why projections of the national population through to 2051, using a 2001 age-sex structure as the base population, and current levels of fertility and mortality which are adjusted in accordance with assumed patterns of demographic change, do not perpetuate the sex ratio imbalances through the projection period. The impact of the existing gender imbalances by age group are built into the base population structure. The fertility, mortality and international migration assumptions do not assume any kind of sex ratio convergence over the period.

In the light of these basic features of a cohort-component population projection, it could be argued that the gender imbalances that have been building up are largely the result of non-demographic factors. The key point for the age group we are interested in here is that those aged 25-34 in 2051 have not yet been born. The population projections are driven

by four demographic processes and structures: fertility, mortality, international migration (or internal migration if a sub-national projection is being prepared), and a base population structure. The interaction of these processes and structures on projections for New Zealand's population through to 2051 did not result in perpetuation of the gender imbalances in the adult working population's age groups. Other factors were at work, once again re-enforcing the need to look elsewhere for explanations for the growing sex ratio disparities, especially since 1991.

Future implications of changes in sex ratios on the New Zealand labour market

> In the short-to-medium term, overall participation rates for women in New Zealand are likely to rise without any change in policy settings, although there may be some fluctuations according to the state of the economy. Policies which aim to increase women's participation may be pushing a rock downhill. Historically, women's and men's participation rates in New Zealand have been gradually converging, as have been women's participation rates in the OECD. It would be no surprise if these trends continued in future decades.
>
> Johnston (2005)

As Johnston (2005) notes in his conclusion to a paper on women's participation in the labour force, in New Zealand, as in other industrialised countries, women's labour market participation rates have been increasing over the long term and are likely to continue to increase. While it is unlikely that changes in absolute sex ratios will have had much direct influence in female employment patterns in the past, if anything they would have further encouraged women into paid work. However, unless the ratios become more extreme, imbalances in sex ratios are unlikely to have a major impact on female employment in the future.

In contrast to absolute ratios, educational sex ratios have in recent times become far more extreme. Directly, and indirectly (such as through the workings of the marriage market), the changes in these ratios are likely to be having some significant impact on the labour market. This impact is also likely to increase in the future as the cohorts the ratios are affecting move through their lifecycles. Some of the likely impacts include:

- Employers increasingly recruiting skilled women
- More women moving into middle and senior management positions
- Work-life balance issues becoming more important for both men and women.
- More men taking on the role as secondary income earners in couple households
- Some further downward pressure on fertility
- Further narrowing of the pay gap

When considering fertility, changes in education and employment for well-educated women, as well as the provision of income support from the state, alongside changes in social norms mean that women in New Zealand can still have a child without a partner.

In terms of balance between paid work and work in the home, given the greater propensity for women to marry 'down', women's increased bargaining power within couple households over issues such as childcare may mean that negotiating work-life arrangements with their employers becomes more important for men in the future.

Some of the changes in education sex ratios may themselves have some small impact on overall sex ratios. For example, if women continue to increase their participation in the labour market, particularly at senior levels, then there is likely to be more demand for household service workers such as cleaners and childcare employees. Based on the experience of some other industrialised countries, it may be that this contributes in a small way to gendered migration.

While the apparent changes in absolute sex ratios by themselves may not have a major impact on the labour market, the fact that they have changed seems to indicate some shifts in both New Zealand's labour market and the global labour market. It appears that there could be an important gender dimension to international migrant flows. How this is operating may be quite different in various segments of the labour market, for example the highly skilled versus the low skilled. If there is an ongoing gender dimension to migration flows then sex ratios need to be considered more when examining issues such as the potential 'brain drain' versus 'brain swap' and when considering the size and overall impact of New Zealand's Diaspora.

Future research

This research has only scratched the surface of the gender imbalances in recent censuses. More study is needed in order to fully understand why sex ratios have apparently changed and, as importantly, how they might change in the future. One critical area needing further investigation is whether ways of collecting data, as well as methods of estimating population counts, 'miss' a group of men. It may be that current estimates of undercounts are conservative. This research needs to be undertaken by Statistics New Zealand.

A further analysis of New Zealand census data could also prove fruitful. The census not only has country of birth but information on where the person was at the previous census. Some of the issues that could be explored using this dataset include the gender and educational breakdown of newly arrived residents born overseas and what types of jobs those emigrants are moving into where there appears to be strongly gendered migration, such as Thai women. The next census takes place in 2006 and analysis from that census along the lines suggested here would be useful.

A more detailed analysis of Australian and UK census data would also be useful. Included in this analysis could be an investigation of the types of jobs New Zealanders are working in and whether they have formed partnerships (and are having children with) with citizens of those countries. This may give some indication as to how likely it is they will eventually return to New Zealand.

The Department of Labour itself has an extensive immigration database and it would be worth examining the gender and education dimensions of recent migration.

Finally, some other datasets may be worth examining in more detail. For instance, while only a small survey, the Dunedin longitudinal study could yield some useful detailed information on the gendered nature of migration, including whether it is the brightest and fittest who have left New Zealand, where people have migrated to and have they formed couples and had children overseas.

Appendix 1

Sex ratios (female to male) for a range of industrialised countries, Ranked by ratio for 30-34 year olds

	20-24	25-29	30-34	35-39	40-44	45-49
Hong Kong 2002*	1.02	1.16	1.32	1.23	1.06	1.02
New Zealand 2000	0.97	1.06	1.09	1.06	1.03	1.02
Singapore 2002	1.00	1.08	1.07	1.00	0.98	0.98
Switzerland 2002	0.98	1.02	1.03	0.99	0.98	0.99
Australia 2002	0.97	1.00	1.02	1.01	1.01	1.01
France 2002	0.98	0.99	1.00	1.02	1.03	1.03
Portugal 2002	0.98	0.99	1.00	1.03	1.04	1.05
Ireland 2002	1.00	0.99	1.00	1.01	1.01	1.02
Israel 2002	0.97	0.98	1.00	1.02	1.06	1.07
Austria 2002	0.97	1.00	0.99	0.97	0.97	1.01
Italy 2001	0.97	0.99	0.99	1.00	1.01	1.02
US 2002	0.95	0.97	0.98	1.00	1.02	1.03
Canada 2002	0.96	0.97	0.98	0.98	1.00	1.01
Japan 2000	0.96	0.97	0.98	0.98	0.99	1.00
Belgium 2002	0.98	0.98	0.97	0.97	0.98	0.99
Hungary 2002	0.95	0.96	0.97	0.99	1.03	1.06
Iceland 2002	0.98	0.97	0.97	1.01	0.98	0.96
Norway 2002	0.97	0.98	0.97	0.95	0.96	0.97
Denmark 2002	0.98	0.99	0.97	0.96	0.97	0.98
Netherlands 2002	0.98	0.98	0.97	0.96	0.97	0.98
Poland 1999	0.96	0.96	0.97	0.98	1.00	1.03
Spain 2002	0.96	0.96	0.96	0.98	1.00	1.01
Sweden 2002	0.96	0.97	0.96	0.95	0.96	0.97
C. Republic 2002	0.96	0.96	0.96	0.96	0.98	1.00
Finland 2002	0.96	0.95	0.96	0.96	0.97	0.98
UK 1999	0.95	0.95	0.96	0.96	0.99	1.00
Germany 2002	0.97	0.96	0.95	0.94	0.96	0.98

Source: UN Demographic Yearbook 2002, http://unstats.un.org/unsd/demographic/products/dyb/dyb2.htm
* Hong Kong is not technically a separate country

While New Zealand stands out amongst industrialised countries in terms of high sex ratios (women to men), in all parts of the world there are countries where the number of women in the 30-34 age group exceeds men. Examples include: Africa (e.g. Benin 1.37, Botswanna 1.07, Nigeria 1.14); North and Central America (e.g. Mexico 1.11, Jamaica 1.10, Haiti 1.06); South America (e.g. Brazil 1.05, Ecuador 1.04, Peru 1.06); Asia (e.g. Azerbaijan 1.12, Cambodia 1.09, Lao 1.13); and Europe (e.g. Belarus 1.02, Lithuania 1.02, Channel Islands-Guernsey 1.04). Some of these ratios reflect internal conflict within

the countries (with higher mortality), some are very small and poor nations near other larger more wealthy nations (e.g. Jamaica), while others are likely to reflect gender migration from a large poor country to a large more wealthy country (e.g. Mexico and the United States).

There are also some countries with a high number of men relative to women in the 30-34 (and other) age groups. Three large ones are China 0.95, India 0.99 and Pakistan 0.87. In some of the younger age groups in these countries the excess of men is even higher. Some nearby Pacific Islands also have similar ratios, for example Fiji 0.98, Niue 0.91 and Tonga 0.96 though in the case of these countries at least some of the excess of men is due to migration of women to labour markets which are sources of remittances.

Appendix 2

Changes in mortality rates for women and men per 100,000 population, age standardised

		1981-84	1986-89	1991-94	1996-99
Actual					
0-14	Male	53.5	50	39.8	34.6
	Female	39.5	36	29.6	26.4
15-24	Male	152	166	150	123
	Female	59.1	59.5	52.8	52
25-44	Male	172	175	168	152
	Female	107	94.2	86	77.8
Ratio (female/male)					
		1981-84	1986-89	1991-94	1996-99
0-14		0.74	0.72	0.74	0.76
15-24		0.39	0.36	0.35	0.42
25-44		0.62	0.54	0.51	0.51

Source: Atkinson J. New Zealand Census-Mortality Study WebTable. *Department of Public Health, Wellington School of Medicine and Health Sciences, University of Otago.* http://www.otago.ac.nz/NZCMSWebTable, accessed 8 July, 2005

Appendix 3

Table 3.1: Location of New Zealand and Australian expatriates

	Actual		%	
	New Zealand	Australia	New Zealand	Australia
Australia	355,765	-	76.6	-
Austria	245	1,686	0.1	0.5
Belgium	301	1,136	0.1	0.3
Canada	9,920	20,155	2.1	6.1
Switzerland	1,148	3,420	0.2	1.0
Czech Republic	35	230	0.0	0.1
Germany			0.0	0.0
Denmark	538	1,663	0.1	0.5
Spain	331	3,913	0.1	1.2
Finland	86	656	0.0	0.2
France	1,071	4,216	0.2	1.3
United Kingdom	58,286	107,871	12.5	32.8
Greece	506	20,449	0.1	6.2
Hungary	35	258	0.0	0.1
Ireland	2,256	6,107	0.5	1.9
Japan	2,401	6,148	0.5	1.9
Korea	-	719	-	0.2
Lunxembourg	33	96	0.0	0.0
Mexico	77	281	0.0	0.1
Netherlands	3,582	9,529	0.8	2.9
Norway	345	1,101	0.1	0.3
New Zealand	-	56,142	-	17.1
Poland	50	608	0.0	0.2
Portugal	48	1,192	0.0	0.4
Slovac Republic	3	52	0.0	0.0
Sweden	763	2,525	0.2	0.8
Turkey	290	2,938	0.1	0.9
United States	26,350	75,314	5.7	22.9
	464,465	328,405	100.0	100.0

Source: Dumont and Lemaître (2004)

Table 3.2: Sex ratios for the Australian born population in the UK, 2001

	UK		UK subset - London	
Age group	Total	Sex ratio	Total	Sex ratio
20-24	11,172	1.64	5,851	1.99
25-29	23,849	1.30	13,891	1.35
30-34	17,550	1.17	7,750	1.16
35-39	10,553	1.03	3,746	0.96
40-44	6,811	1.05	2,071	0.96
45-49	5,076	1.22	1,342	1.19

Source: UK census

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