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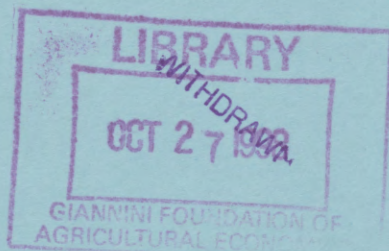
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**THE LABOUR MARKET OUTCOMES OF  
NEW ZEALAND'S OLD AND NEW IMMIGRANTS**

**Liliana Winkelmann and Rainer Winkelmann<sup>1</sup>**

***Discussion Paper***

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Christchurch, New Zealand

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**THE LABOUR MARKET OUTCOMES OF  
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# The Labour Market Outcomes Of New Zealand's Old And New Immigrants

Liliana Winkelmann and Rainer Winkelmann<sup>1</sup>

This study examines the relative labour market position of immigrants using unit record data from the 1981, 1986, and 1996 Population Censuses. We compare the labour market outcomes of immigrants immediately after arrival in New Zealand and in subsequent years with those of similar New Zealand born individuals, identify the factors associated with differences in labour market outcomes, and analyse the changes in the relative labour market outcomes of immigrants between 1981 and 1996. We find that in the first year after arrival in New Zealand a typical immigrant had a 20 percent lower income than a similar native. This entry disadvantage disappeared after 20-30 years of residence. Convergence was generally quicker for participation and employment rates. However, the evidence suggested a substantial amount of heterogeneity. Most notably, the Asian and Pacific Island immigrants of the early 1990s came with a much larger entry disadvantage than other groups of immigrants or earlier arrivals. The decline in relative labour market outcomes could not be explained by the changing region-of-origin composition, nor by changes in any of the observed characteristics. One possible explanation is that structural changes in the labour market have caused an increased penalty for migrants from predominantly non-English speaking countries.

## 1 Introduction

New Zealand is a traditional immigration country. The ease and extent by which immigrant become integrated into the domestic labour market is likely to be one of the key factors behind the country's future attitudes towards immigration. Immigrants who have high levels of productivity or skills that are in high demand are more likely to make a significant economic contribution than others. Their tax contributions are likely to be higher, and their need for social assistance lower. The benefits of

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immigration to New Zealand are likely to be higher if immigrants fully realise their productive potential and perform well in the labour market.

This study provides empirical evidence on the labour market position of immigrants. It complements previous research on New Zealand data by Poot et al. (1988), Poot (1993) and Zodgekar (1997), among others. The study extends this previous research by providing information up to 1996, adopting a different methodology in order to compare outcomes of immigrants and natives, and by addressing a number of hitherto, at least in the New Zealand context, unanswered questions.

The two main objectives of this paper are to compare the labour market outcomes of immigrants in the 1970s, 1980s and 1990s with those of similar New Zealand born individuals, both at entry and in subsequent years, and to identify the factors associated with relatively good and relatively poor outcomes. Three different indicators of labour market outcomes are used, namely labour force participation on Census day, employment (conditional on participation) on Census day, and annual income (conditional on employment on Census day). The main performance factors include the educational qualifications of immigrants and natives, their age, and, for explaining participation decisions, their family and parental status.

As far as immigrants are concerned, we suspect that the cumulative time spent in New Zealand is an important determinant of their relative labour market outcomes, and accordingly, all of our analyses control in one way or another for this "Years since Migration" (YSM) effect. An equally important issue is that of language proficiency. Unfortunately, a direct question on language was only included in data for 1996, which does preclude a comparative analysis of the effect of language over time. Instead, we classify immigrants either by one of six regions-of-origin, or, based on their country of birth, by English-speaking/Non-English speaking background. The region/English background factor is likely to capture not only the effect of language, but also other characteristics such as "cultural similarity" that are likely to be correlated with outcomes. Finally, our analysis addresses two further issues of

relative immigrants performance, namely the importance of age-at-arrival, and the importance of the size of the arrival group.

The results from this study indicate that a typical immigrant arrived with income shortfall of about 20 percent relative to a similar native that disappeared after 20-30 years of residence. Differences in participation and employment rates were less long-lived. Immigrants with English speaking background typically "out-performed" non-English speaking background migrants. Most notably, Asian and Pacific Island immigrants who came to New Zealand in the early 1990s had a much larger entry disadvantage than other immigrant groups who arrived at the same time, or than Asian and Pacific Island immigrants who came before 1986. The decline in the relative labour market outcomes cannot be fully explained by the changing country-of-origin composition, or by changes in any of the observed characteristics. One possible hypothesis is that structural changes in the labour market might have put immigrants with insufficient language skills at an increasing disadvantage.

The structure of the paper is as follows: Section 2 provides some definitions, describes the data sets and the sampling methods and concludes by providing some basic summary statistics. Section 3 starts with a discussion of the methodology that is used in order to compute education and age adjusted differences in outcomes between immigrants and New Zealand born persons. This methodology is then used to compare the incomes and participation and employment rates between recent immigrants and "similar" New Zealanders.

Section 4 deals with the issue of convergence. It is well known that cross section data alone are insufficient to determine whether, and how fast, immigrants adjust to the host country labour market conditions, and an alternative pooled regression model is presented. The results from the analysis are presented by way of predicting age-outcome profiles (income, participation, employment) for a 25 year old immigrant and a same aged New Zealander over the next 25 years.

Section 5 provides details on the various performance factors and their contributions in explaining the differences in labour market outcomes. In particular, this section evaluates possible explanations of the declining fortunes of some immigrant groups who arrived in the first half of the 1990s. Section 6 concludes.

## 2 Data

The analysis in this paper is based on unit-record data from the 1981, 1986, and 1996 New Zealand Census of Population and Dwellings. The 1991 Census was excluded from the study since it contains no information on the year in which an immigrant arrived in New Zealand. The study population comprises all working age individuals (15-64) living in New Zealand on Census night. The data are composed of three different subsamples: a 5 percent random sample of all individuals born in New Zealand ("natives"); a 20 percent random sample of all individuals born in the UK or Ireland; and the full population of all other immigrants (i.e., people born outside New Zealand, the UK or Ireland).<sup>2</sup> Descriptive statistics in this paper are computed using appropriately weighted data.

For the purpose of this study, immigration status is solely defined by place of birth. An immigrant is someone who lives in New Zealand and was born outside of New Zealand. An immigrant may or may not be a New Zealand citizen or permanent resident and may or may not have been born to New Zealand parents. In particular, foreigners on student or work permits may be included in the immigrant population as long as they gave a New Zealand address as their usual place of residence. The lack of information on residence status is unfortunate, but unavoidable with Census data. Natives are all people born and living in New Zealand. We will refer to them interchangeably as "natives", as "New Zealanders", or as the "New Zealand born".

A *recent immigrant* is an immigrant who has spent less than 5 years in New Zealand at Census day. In 1996, for instance, a recent immigrant was an immigrant who

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<sup>2</sup> See the companion report (Winkelmann and Winkelmann, 1998) for more details, including an account on how we dealt with missing responses.

arrived between March 1991 and February 1996.<sup>3</sup> While one might be tempted to think of the stock of recent immigrants as being representative of the flow of immigrants over the period, this view ignores the possibility of out-migration and death. A quantitative assessment of the incidence of out-migration will be provided below. For much of the analysis, it is essential to distinguish between *cohorts* of immigrants. A cohort is a group of immigrants who arrived in New Zealand in the same calendar year(s). For simplicity, we group all immigrants into 8 distinct cohorts: pre-1960, 1961-65, 1966-70, 1971-75, 1976-80, 1981-85, 1986-90, and 1991-95.

In parts of the analysis, we group immigrants by region-of-birth. The six possibilities are the UK and Ireland, Australia, Europe & North America, Pacific Islands, Asia and other regions. An alternative classification is by English background status, based on the 1996 question on English proficiency. If more than 95 percent of "most recent" (0-1 years of residence) immigrants from any country responded that they were proficient in English, all immigrants from that country in all three Census years were classified as "English Speaking Background" (ESB). Else, their status was "Non-English Speaking Background" (NESB).

Finally, we had to deal with the fact that Statistics New Zealand had redefined several of the variables between the three Census years. Whenever possible, definitions have been adopted that make the information as consistent as possible over time. The key variables where definitional adjustments had to be made were labour force status and highest qualification. We by-passed the problem of classification changes to the highest qualification level by looking at a broad classification only where no changes occurred (using the categories: no qualification, school qualification, vocational qualification and university qualification). The labour force status definition used in this study is based on the pre-1986 definition of unemployment. Unemployed are all those who were not employed and who looked for a job during the last four weeks. Those who looked for work using newspapers only, or were not available for work,

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<sup>3</sup> In the full report, a slightly different convention was adopted, in that "recent" immigrants were defined as those with less than 6 years of residence. However, for the purpose of a uniform treatment in the regression part with five-yearly cohort dummies, we use here this different definition.



are not excluded under this definition, in contrast to the current official definition of unemployment.

We conclude this section of the paper with some simple descriptive statistics of our final data set. Table 1 gives absolute and relative frequencies for working age immigrants, by region-of-origin and Census year and separately for all immigrants and recent immigrants only.

**Table 1. Working-aged immigrants by region of birth**

	<b>1981</b>		<b>1986</b>		<b>1996</b>	
	Nos.	%	Nos.	%	Nos.	%
<b>All Immigrants</b>						
UK & Ireland	179825	56.37	178805	52.47	151615	36.09
Australia	27487	8.62	29189	8.56	31535	7.51
Europe & Nth America	42954	13.46	47042	13.80	50012	11.90
Pacific Islands	41644	13.05	52253	15.33	74193	17.66
Asia	18831	5.90	24446	7.17	88889	21.16
Other	8295	2.60	9072	2.66	23892	5.69
Total	319036	100.00	340807	100.00	420136	100.00
(Total as % of Working Age Population)		(16.2)		(16.3)		(18.8)
<b>Recent Immigrants</b>						
UK & Ireland	12020	31.12	12325	27.52	14775	14.92
Australia	5527	14.31	4717	10.53	6156	6.22
Europe & Nth America	5956	15.42	8140	18.17	12871	13.00
Pacific Islands	7340	19.00	9887	22.08	8748	8.84
Asia	6141	15.90	8133	18.16	46607	47.08
Other	1638	4.24	1585	3.54	9838	9.94
Total	38622	100.00	44787	100.00	98995	100.00
(Total recent as % of all immigrants)		(12.1)		(13.1)		(23.6)

In 1981, New Zealand's working age population was 16.2 percent foreign born. During the next 15 years, the share of foreign born among the resident working age population increased by 2.6 percentage points to 18.8 percent in 1996. Simultaneously, the composition of immigrants by region-of-origin shifted substantially. The role of immigration from the UK and Ireland, while still important,

declined. Although absolute immigration flows (net of outmigration) from the UK increased, from 12 thousand between March 1976 and February 1981, to almost 15 thousand between March 1989 and February 1996, the share of UK and Irish immigrants among all immigrants slipped to 36 percent in 1996.

There were two reasons. Firstly, the flows were well below levels sufficient to replace immigrants who reached the cut-off working age of 65 years. More importantly, immigration flows from other regions of origin, most notably Asia, but also Europe and North America and the "other" regions, increased over-proportionally (whereas flows from Australia and the Pacific Islands displayed no strong trend). In 1996, almost one in two recent immigrants was born in Asia. The overall large immigration flows in the early 1990s are reflected in the large proportion of recent immigrants among all immigrants, 24 percent in 1996, almost twice as high a proportion than in 1986.

The shift of immigrants towards non-traditional sources such as Asia is one of the factors that have substantial implications for the labour market outcomes of New Zealand's immigrants.

**Table 2. Educational attainment of immigrants and New Zealand born (in percent)**

	No quals	School	Vocational	University
<b>1981</b>				
All Immigrants	45.8	25.9	20.5	6.2
Recent Immigrants	36.5	28.9	19.5	12.1
New Zealand born	49.5	26.7	16.9	3.6
<b>1986</b>				
All Immigrants	30.9	27.9	31.2	8.5
Recent Immigrants	21.8	30.1	30.6	14.7
New Zealand born	38.8	28.5	24.8	5.2
<b>1996</b>				
All Immigrants	23.3	31.9	27.8	15.5
Recent Immigrants	12.8	34.9	22.8	25.8
New Zealand born	29.6	34.7	26.1	8.0

Another factor that will prove important over the course of this study is the comparatively high proportion of immigrants with advanced degrees (relative to the

New Zealand born working age population). The "education gap" is large, and, depending on the metric one uses, actually increasing over time. This is seen in Table 2.

For instance, 12.1 percent of recent immigrants had a university degree in 1981, but only 3.6 percent of New Zealanders. The difference was 8.5 percentage points. By 1996, this difference had increased to 17.8 percentage points. In relative terms the difference was roughly stable, with recent immigrants being about 3 times (and all immigrants about 2 times) as likely to have a university degree than natives. Immigrants were also more likely to have a vocational qualification, although the differences were smaller in both absolute and relative terms. In summary, there can be no doubt that New Zealand's immigrants are relatively skilled, in terms of the crude qualification measures available in the Census, and this fact should stack the odds in favour of immigrants when it comes to labour market outcomes.

We conclude this section with a brief discussion of New Zealand's out-migration experience. Out-migration is an important issue, since it not only affects the number and composition of immigrants over time, but also puts limitations on what we can learn from Census data about the past and future labour market outcomes of those who stay. This issue will be discussed further in Section 4. For now, we only ask whether or not out-migration was a quantitatively important phenomenon in the New Zealand context.

Out-migration rates ideally refer to immigrant flows. However, any immigrant arrival cohort has already been partially reduced in size by the time it is observed in the nearest Census. The problem is smaller if only very recent immigrants are considered. Accounting for the trade-off due to decreasing sample sizes, we focus on immigrants with 0-1 years since migration (i.e. immigrants who are in the country for a period of at most 23 months), and 2-5 years since migration, respectively. By comparing the number of enumerated immigrants from a certain region of origin and of a certain age in both 1986 and 1996, we can compute 10-year out-migration rates formally as

*1 - (cohort size in 96 census / cohort size in 86 Census)*

This number gives the combined effect of return-migration, step-migration, deaths, and sampling error (due to temporary absences of immigrants at Census night, misclassifications in both the year of arrival and country-of-origin variables, or, in general, a changing coverage rate of the Census).

**Table 3. Ten-Year Outmigration Rates (1986-1996), by Age in 1986, Years in New Zealand, Region-of-Origin, and Gender (in percent) .**

	UK	AUS	EU	PI	ASIA	OTH	Total
<b>Men</b>							
Age in 86: 15-24							
Ysm 0-1	-51.6	-73.4	-73.8	-4.2	-54.1	-35.3	-40.6
Ysm 2-5	-39.6	-53.3	-35.6	-33.1	-54.8	-23.3	-40.7
Age in 86: 25-44							
Ysm 0-1	-45.9	-65.1	-50.0	-10.4	-43.8	-36.8	-42.7
Ysm 2-5	-34.4	-53.7	-35.2	-16.2	-26.8	-18.7	-31.8
<b>Women</b>							
Age in 86: 15-24							
Ysm 0-1	-39.3	-72.8	-64.1	14.9	-40.2	-18.7	-26.0
Ysm 2-5	-28.4	-50.8	-39.9	-26.9	-43.8	16.4	-33.3
Age in 86: 25-44							
Ysm 0-1	-37.9	-62.1	-46.6	11.9	-21.6	-25.0	-31.9
Ysm 2-5	-24.0	-48.2	-32.4	-9.6	-20.3	-12.8	-25.0

Table 3 shows that out-migration was quantitatively important. Forty three percent of recently arrived immigrant men (those who had come to New Zealand in the 23 months prior to the Census), and 32 percent of recently arrived immigrant women were not enumerated by the 1996 Census among those aged 25-44 in 1986. As expected, out-migration rates tended to be somewhat lower for more established immigrants who had 2-5 years in the country prior to the Census. A declining "hazard rate" simply means that immigrants who are most likely to leave are, on average, the first to leave which in turn reduces the average out-migration propensity among those left behind. Except for Pacific Islanders, out-migration rates were higher for the younger immigrants. They varied substantially by region-of-origin. The highest rates were recorded for Australian immigrants, the lowest for Pacific Islands immigrants.

Overall, out-migration rates are substantial, and this has to be kept in mind in the following analysis.

### 3. Adjusted Entry Differentials

Immigrants and New Zealanders differ in a number of respects. Hence, direct comparisons between the two groups are likely to be misleading. In this section, we propose a simple approach that allows us to distinguish between two alternative explanations for differences between immigrant and native labour market outcomes. One explanation is linked to differences in observable productive characteristics, such as age, education, and by differences in the level of economic activity (hours of work when income is considered). The other explanation is that there is a "genuine" immigrant effect, i.e., labour market outcomes for immigrants are intrinsically different from those of *similar* natives.

A variety of causes for such intrinsic differences have been put forward in the literature. For instance, immigrants need time to familiarize themselves with the host country labour market institutions, to learn the local language and customs, to generate credible information about their skills, or to find a good match. By the same token, the effect of these transition problems can be expected to decline as a function of time spent in New Zealand. Immigrants' labour market outcomes should over time converge to those of similar natives.

In this part we conduct a cohort analysis of the relative *incomes* of employed immigrants and natives that explicitly measures how much of the difference in incomes, or participation and employment rates between immigrants and natives remains after we control for hours of work, gender, and productive characteristics. The approach is easily generalised to an analysis of relative *participation rates* or relative *employment rates*.

Technically, *unadjusted* log income differentials (together with their estimated standard errors) are obtained by regressing logarithmic income ( $y$ ) on a constant and a

full set of cohort indicator variables (C). *Adjusted* log income differentials are obtained by regressing logarithmic income on a constant, a full set of cohort indicator variables *plus* hours, a male indicator, highest qualification level (indicators for school, vocational and university qualifications), age and age squared (X), using observations on employed individuals only.<sup>4</sup>

$$(1) \quad \log(y_{it}) = X_{it}\beta_t + \sum_{k=1}^8 \eta_{kt}C_k + \varepsilon_{it}$$

where  $k = \text{pre60, 61-65, 66-70, 71-75, 76-80, 81-85, 86-90, 91-95}$ . In this context, the coefficients on age and education can be interpreted as "returns". For instance, the coefficient on *university* gives the predicted log income differential between otherwise similar university graduates and workers without qualifications (the reference group). This coefficient approximates the percentage gap in income between the two qualification levels, *ceteris paribus*.<sup>5</sup> In the same way,  $\eta_{kt}$  measures the relative difference in year  $t$  between the incomes of immigrants of cohort  $k$  and natives that cannot be explained by differences in endowments or economic activity. Finally, both returns and cohort effects are allowed to vary over time, as model (1) is estimated separately for each Census year.<sup>6</sup>

We first focus our discussion on the results for the adjusted and unadjusted log income differentials of *recent* immigrants, i.e.,  $\eta_{76-80}$  in 1981,  $\eta_{81-85}$  in 1986, and  $\eta_{91-95}$  in 1996. These differentials might be referred to as "entry" differentials, although one should keep in mind that the recent cohort includes immigrants who have been in the

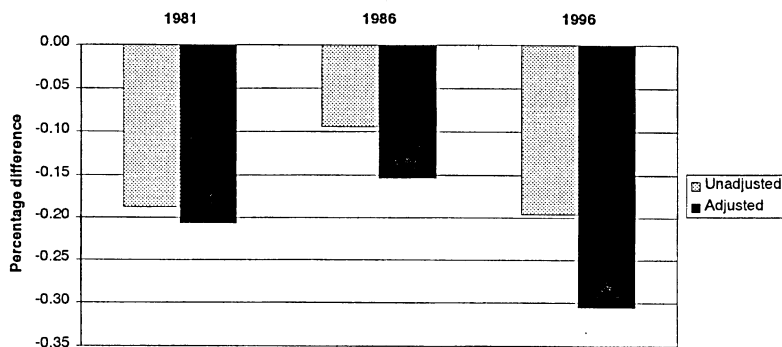
<sup>4</sup> Census income data are provided in grouped form. For our analysis, we assigned the midpoints of the group and then took logarithms.

<sup>5</sup> In instances where changes are large, the log approximation becomes somewhat imprecise. One can then use the formula  $e^{b-1}$  (where  $b$  is the log differential) in order to obtain the correct percentage change.

<sup>6</sup> The returns are restricted to be the same for natives and immigrants. The rationale behind this restriction is that we are at this stage specifically interested in determining the part of the overall (i.e.: unadjusted) income differential that *cannot* be explained by differences in endowments (i.e., the adjusted wage differential). We are not interested in finding out the channels through which apparently similar endowment points might lead to different outcomes, the two possibilities being either a difference in the intercept, or cohort and time specific differences in the way that endowments  $X$  are evaluated by the labour market

country for up to 5 years. Figure 1 shows the overall log income differentials for the three Census years.

**Fig. 1. Unadjusted and adjusted log-income differentials between recent immigrants and New Zealand born workers, 1981, 1986 and 1996**



In 1981, average incomes between employed recent immigrants and employed natives differed by about 18 percent. In 1986, this income shortfall of immigrants decreased to less than 10 percent. The 1996 gap was close to 20 percent. How does the adjustment change the conclusions? First, adjusted log income differentials exceed the unadjusted ones in all cases. The main driving factor behind this result are the relatively high education levels of immigrants. Hence, immigrants “look better” when compared to an average native (who turns out to have relatively low levels of qualifications) than when compared to a “similar” native (who has higher education levels and hence higher incomes than the average native). The effect of the adjustment steadily increased over time, partially reflecting the increasing (absolute) gap in the proportion of university graduates. By 1996, the adjusted income differential of 30 percent was about 50 percent larger than the unadjusted log income differential. Hence, far from being able to “explain” income difference, differences in personal characteristics actually hide some of the genuine disparities between immigrants and natives.

How justified is it to think of a “representative” immigrant in the New Zealand context. Figures 2 and 3 show 1996 income differentials for recent immigrants by subgroups. Figure 2 distinguishes between migrants with English speaking background and non-English speaking background, while Figure 3 looks at six separate regions-of-origin.

**Fig. 2. 1996 Unadjusted and adjusted log-income differentials, recent ESB and NESB immigrants**

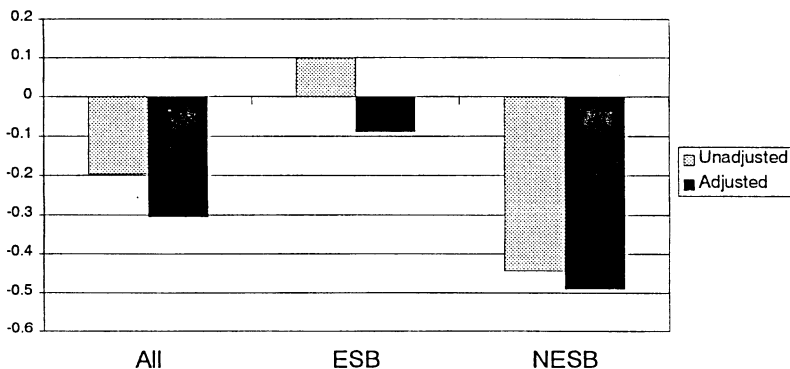


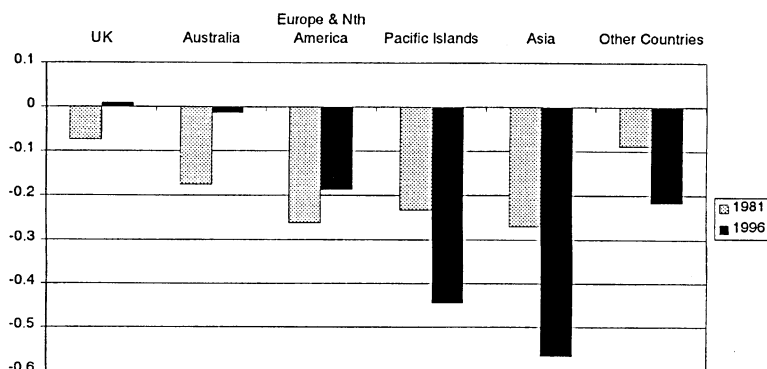
Figure 2 shows that the 1996 relative incomes of recent ESB and NESB migrants differ widely. The unadjusted results indicate that ESB migrants in fact had an income premium, i.e., had incomes above those of the average New Zealander. Once the differences in characteristics are taken into account, a small shortfall of less than 10 percent emerged. NESB migrants, by contrast, had a log income gap of almost 50 percent.<sup>7</sup> Also, the adjustment made less of a difference for NESB migrants than it did for ESB migrants, as the former group of immigrants had average characteristics more similar to those of natives (in terms of observables such as highest qualification).

Figure 3 gives a more detailed picture showing that immigrants essentially fell in three different groups in 1996. UK, Irish and Australian immigrants had incomes that were very close to those of similar natives. European & Nth American and “Other”



immigrants filled a medium position with a gap around 20 percent, while Pacific Island and Asian immigrants had “large” adjusted 1996 differentials of 45 and 55 percent, respectively. Fifteen years earlier, the distribution of log income differentials across the regions-of-origin was much more equal. The increased inequality in 1996 was fueled by both a relative improvement in the position of UK and Australian immigrants and a relative deterioration in the position of Asian and Pacific Island immigrants. We will follow up some possible explanations for these trends below.

**Fig. 3. Adjusted log-income differentials, recent immigrants, 1981 and 1996, by region-of-origin.**



Income of those who are employed is only one among several indicators of relative labour market performance. While it is an important and frequently used indicator, it is likely to understate the true gap between native and immigrant performance since it includes only immigrants who have passed a first “hurdle” in the integration process, namely to find a job, a group of immigrants that is likely to be positively selected.

In order to analyse the adjusted relative participation and employment rates of immigrants we modify model (1) in order to account for the binary dependent variable. For convenience, we use the Logit model, where

<sup>7</sup> If the exact formula was used to compute the predicted percentage difference the result would be a 39 percent income shortfall relative to similar natives.

$$P(y_{it} = 1) = \frac{e^{\xi_{it}}}{1 + e^{\xi_{it}}}$$

and

$$\xi_{it} = X_{it}\beta_i + \sum_{k=1}^8 \eta_{kt}C_k$$

as before. There are some changes in the X variables, as we dropped the hours of work variable and included controls for parental and family status. Also, we estimated the model separately for men and women. The model is intrinsically non-linear and the parameters  $\beta_i$  and  $\eta_{kt}$  no longer have a direct simple interpretation. This problem can be solved by using the estimated parameters in order to obtain the average predicted probabilities (of being participant or employed) for a certain group (natives or immigrants of cohort  $k$ ), where the predictions are based on the actual characteristics of individuals in each group. The percentage difference between predicted immigrant and native probabilities provide then estimates of the adjusted participation and employment (conditional on participation) differentials.

**Fig. 4. 1996 Unadjusted and Adjusted Differences in Participation Rates, NZ born and Recent Immigrants**

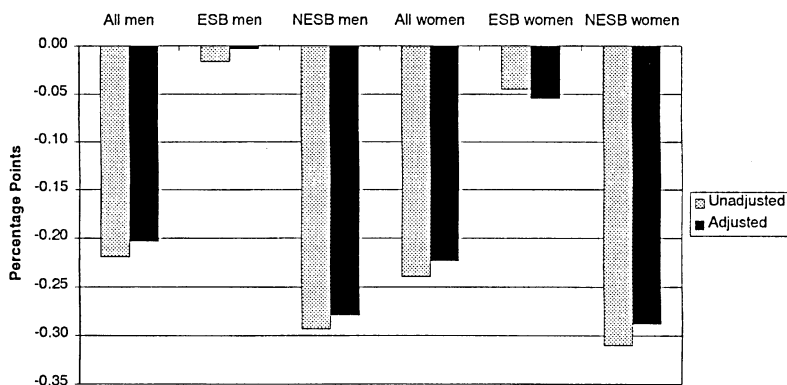
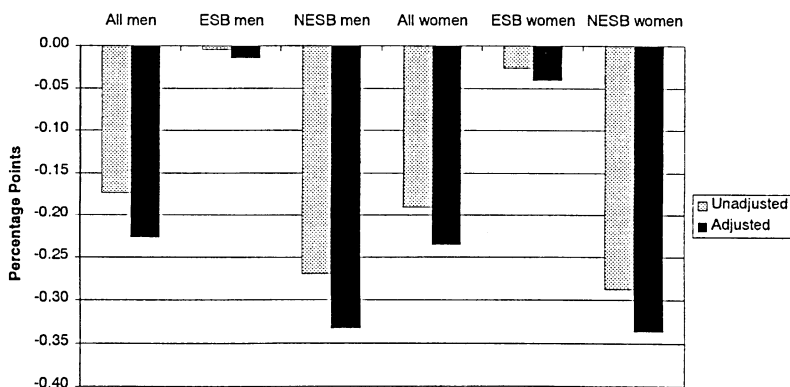


Figure 4 shows the adjusted 1996 participation differences between recent immigrants and natives, for all, ESB and NESB men and women. The overall gap ranged from 20 to 25 percentage points. In the case of participation rates, adjusting for differences in characteristics reduced the differences between immigrants and natives somewhat.

One likely explanation is the dominance of the age effect. Recent immigrants are, on average, younger than natives, which contributes to a lower participation rate for this group. However, most of the differences in participation rates remain unexplained by the observed characteristics. As already observed for income, there are large differences between ESB and NESB immigrants. ESB migrants in 1996 had participation rates very similar to those of natives, in particular among men while the female adjusted gap was only 5 percentage points. By contrast, NESB migrants had participation rates that were between 25 and 30 percentage points below those of natives, in adjusted terms.

Relative employment rates showed a very similar pattern with large differences for recent NESB immigrants (about 33 percentage points in adjusted terms), virtually no differences for ESB male immigrants, and very small differences for ESB female immigrants. In contrast to participation, adjusted employment differentials were larger than the unadjusted ones, which is likely a reflection of the relatively low proportion of unskilled workers among immigrants in conjunction with a relatively high unemployment rate among unskilled workers.

**Fig. 5. 1996 Unadjusted and Adjusted Differences in Employment Rates, NZ born and Recent Immigrants**



To summarize, labour market outcomes (measured as income, participation and employment) of immigrants in the first years after entry, after taking into account

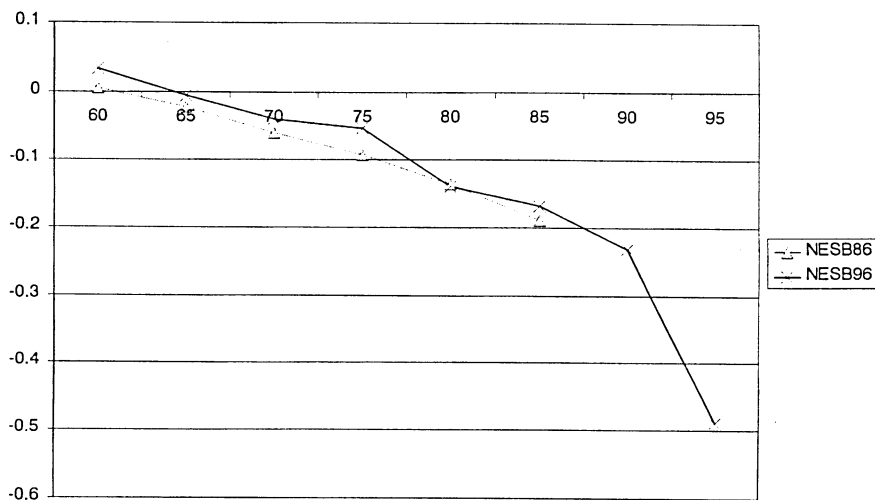
differences in individual characteristics, were "inferior" to those of natives in most cases, recent UK and Australian immigrant men in 1996 being the exception. While observed characteristics such as age and education turned out to be rather unimportant in explaining differentials in outcome, other unobserved factors that are correlated with region-of-origin and, by corollary, with "English speaking background status, are very important. Male UK&Irish and Australian recent immigrants were almost indistinguishable to natives in 1996, recent immigrants from non-English speaking countries, mostly Asians and Pacific Islanders, had very large differentials in outcomes in that year. The experience of the earlier 76-80 and 81-85 cohorts was much more homogeneous.

The initial labour market outcome is not the only factor that determines the eventual success of immigrants in the New Zealand labour market. In hand goes the question if, and how fast, immigrants improve their relative position with time spent in the country. In the following Section, we will examine the evidence for past immigrants' convergence in labour market outcomes.

## 4 Convergence

As a first approach to the problem, one might be tempted to plot the estimated cohort effects from model (1) by year. Figure 6 provides such an exercise.

**Fig. 6. Adjusted Log-Income Differentials, 1986 and 1996, Non-English Background Migrants, by Period of Arrival**



The crossed line connects the estimated cohort effects for non-English speaking immigrants based on the 1996 Census year. The most recent 91-95 cohort had a differential of approximately -50 percent. Immigrants, who came to New Zealand five years earlier, between 1986 and 1990, looked much better in 1996 than the most recent arrivals as they had an estimated income differential of about 23 percent. The relative 1996 incomes of the 81-85 cohort exceeded those of the 86-90 cohort by another 6 percentage points. The same pattern continued for earlier cohorts. In each case, the relative incomes of earlier cohorts exceeded those of later cohorts. Does this pattern mean that earlier cohorts were better off *because* they spend more time in New Zealand and thus had the opportunity to adjust to the new environment?

Figure 6 suggests that this was not the case. Comparing the two curves for the 1986 and 1996 Census estimates, respectively, we find, for instance, that the 1981-85 cohort had a relative income gap of 19 percent in 1986. Ten years later, the relative income gap had decreased to 17 percent for this cohort of immigrants. Hence, the estimated "return" to 10 years of residence was only 2 percentage points, much less than the 29 percentage points suggested by the single 1996 cross-section. This discrepancy arises, as the most recent cohort in 1996 was much less well off, in relative terms, than the most recent cohort in 1986. In such a situation, estimates of convergence rates from cross-section will be upwardly biased, as is well known in the literature (see, for instance, Borjas, 1994).

This problem has prompted the development of a methodology that allows separating the effects of genuine convergence from the effects of potentially changing cohort quality. Consider, for instance, the following model

$$(2) \quad \log(y) = X\beta + \sum_{k=1}^8 \eta_k C_k + \delta YSM + \phi YSM^2 + \gamma YEAR86 + \lambda YEAR96 + \varepsilon_{it}$$

$\eta_k$  measure the percentage difference in income between immigrants of cohort  $k$  and otherwise similar natives *in the first year after arrival* (for  $YSM=0$ ), whereas  $\delta$  and  $\phi$  determine the rate of convergence. A typical income adjustment path for cohort  $k$  would feature an initial income disadvantage upon entry ( $\eta_k < 0$ ), combined with subsequently faster income growth for foreign-born ( $\delta > 0$ ).  $\delta$  literally measures the relative income growth attributable to the first year of residence. If, as we expect,  $\phi$  is negative, then relative income growth slows by  $-2\phi$  percentage points in each subsequent year. In this framework, income convergence occurs, if at all, after

$\left( -\delta + \sqrt{\delta^2 - 4\phi\eta_k} \right) / 2\phi$  years.<sup>8</sup> Estimating models such as (2) requires pooled data from at least two cross-sections. In our application, we estimate the model jointly for the 1981, 1986 and 1996 Census years. Moreover, we generalise the model somewhat

by interacting the qualification variables with both an immigrant dummy and the YSM polynomial. In this way, entry differentials between immigrants and natives and convergence rates are allowed to vary by qualification levels.<sup>9</sup>

We start the presentation of our results with a discussion of entry differentials for the various region-of-origin groups. While we have already touched on this issue in the previous section, by comparing adjusted income differentials for recent immigrants in 1981, 1986 and 1996, model (2) offers two advantages. Firstly, it estimates the adjusted differentials *in the first 12 months after arrival*, rather than mixing together immigrants with between zero and four years of residence. Secondly, the model allows estimating the entry differentials for immigrants who arrived in New Zealand as far back as the 1960s or earlier, and thereby gives a better indication of the long-run trends in income differentials.

Fig. 7. Income differentials of each entry cohort, male immigrants, by region of birth.

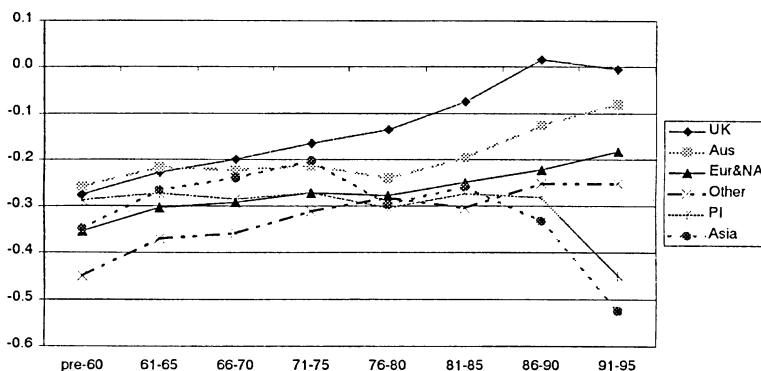


Figure 7 plots the entry differentials for male immigrants, pre-1960 to 1995.<sup>10</sup> It corroborates what was said before in the context of English versus non-English

<sup>8</sup> Selective out-migration may distort this inference. If, on average, the less successful migrants leave, then the estimated convergence rates will overstate the true economic progress of those who stay (see, for instance, Borjas, 1994).

<sup>9</sup> An example for a typical regression model is given in Appendix A. The full set of regression is available in Winkelmann and Winkelmann (1998).

speaking migrants. Pre-1981 entry differentials were relatively similar for the various region-of-origins (with the possible exception of the UK and "other" countries). However, since the 1980s the gap between English background migrants (mainly UK, Australia, Europe & Nth America) and non-English background immigrants started to widen, as the relative income position improved for the former group of immigrants but deteriorated for the latter. The most substantial change did occur, however, not before the 1990s when entry differentials for Pacific Island and Asian cohorts dropped by large amounts. In a historical perspective, though, these two observation points appear to be outliers.

**Fig. 8. Income differentials of each entry cohort, female immigrants, by region of birth.**

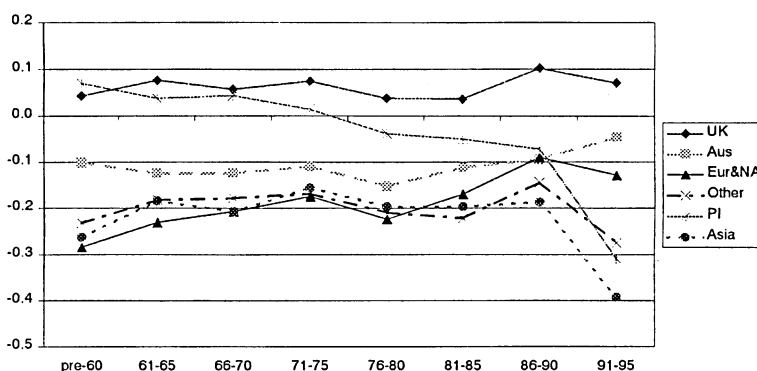


Figure 8 repeats the same type of analysis for female immigrants. While the female pattern differs somewhat from the male one – female UK immigrants had a positive adjusted entry differential throughout the period, and female Pacific Island immigrants up to 1975 - we observe the same relative improvements of Australian, European and North American immigrants since the 1980s and the same large decline in adjusted differentials for Asian and Pacific Island immigrant women between 1990 and 1995.

<sup>10</sup> Literally speaking, these entry differentials are for unqualified immigrants and natives. While the size of the differentials depend on the qualification, the trends over time are unaffected by the selected qualification group in the context of our model.



Next, we turn to the issue of convergence. Figures 9, 10 and 11 summarise the income position of immigrants and natives over the life cycle. Figure 9 shows "age-income" profiles, by English background and sex, separately for workers with school qualification only and for workers with university qualification. Workers are followed from the age of 25 (the year of arrival in the case of immigrants) through to the age of 50. They are assumed to work full-time (40 hours per week) and immigrants' entry differentials are set to the (arithmetic) cohort average for the group

For example, the upper left graph of Figure 9 shows the age-income profiles of male English background migrants. The vertical distance between the two qualification curves gives the approximate percentage difference in income between school graduates and university graduates of a given age. Both natives and immigrants had substantial returns to a university qualification. The vertical distance between the immigrant and native curves, for a given qualification level, gives the approximate percentage difference in income between immigrants and natives. This vertical difference tended to decline with age and eventually disappeared, after about 18 years for school graduates and after about 20 years for university graduates. Hence, convergence took place.

The main reason why we allowed convergence profiles to differ by education level was our interest in the "skill transferability hypothesis". According to this hypothesis one of the reasons why immigrants face an initial disadvantage in the host labour market, relative to natives with the same qualifications, is that it takes time to generate credible information about the true value of the qualification, or, in the case of some professions, to obtain the required license. As a consequence, more highly qualified immigrants should face a larger initial disadvantage than others, and also have faster subsequent convergence rates as the true value of their qualifications is revealed.

From Figure 9 we see that this hypothesis appears not to be supported by the experience of English background male immigrants. To the contrary, less qualified ESB immigrants had a larger initial income disadvantage and faster subsequent

adjustment rates. However, the transferability hypothesis is supported by the experience of non-English background immigrant men, depicted in the upper right panel of Figure 9, as more qualified Non-English background migrants had a substantially larger entry disadvantage but also faster subsequent income growth. The difficulty of NESB immigrants in making productive use of their qualifications upon arrival is illustrated by the low initial returns to a university qualification (relative to a school degree) of only 33 percent (compared to 46 percent for ESB migrants).

As expected, the overall income differentials relative to natives were much larger for NESB migrants than for ESB migrants. NESB migrants with university qualification are predicted to reach parity with similar natives, although it will take about 20 years. NESB migrants with school qualification only are unlikely to reach native income levels within the time horizon of this analysis.

Are women different? The two lower panels of Figure 9 repeat the previous type of analysis for female immigrants. Female profiles tended to be flatter than male ones. There were two contributing factors. Firstly, female returns to experience were smaller (as were the returns to qualifications). Female native incomes increased by 35 percent over the 25-year period, compared to an increase by 54 percent for males. Secondly, female immigrants had slower rates of convergence. The differences between ESB and NESB migrants were less pronounced than those for men, and convergence was achieved after about 25 years for ESB immigrants and NESB immigrants with university qualification.

Figure 10 shows age-labour force participation profiles for a typical 25 year old immigrant and native over the next 25 years of their careers. The profiles are drawn for a joint parent (i.e., a parent who lives together with a partner) with either university or school qualification. The left axis literally gives the probability that a randomly selected person with certain characteristics (e.g., native, aged 35, with university qualification) participates in the labour market. Differences between two profiles can be interpreted as the marginal effect (measured in percentage points) of a

variable, either university qualification versus school qualification, or native versus immigrant, on the participation probability, *ceteris paribus*.

A 25-year-old New Zealand born man with university qualification had a predicted participation probability of about 97 percent. The participation probability of a similar ESB immigrant was 92 percent for university graduates and 90 percent for school graduates. After five years of residence, the native-immigrant difference was less than 2 percentage points. A 25-year-old NESB immigrant man had an initial participation probability of 84 percent. Again, convergence was reasonably fast and after 5 years, the differences were less than 5 percentage points. However, predicted NESB participation rates never reach those of natives for school graduates. One possible explanation for the lower initial participation rates of NESB immigrants, in particular for the 1991-95 cohort of immigrants, is participation in education. There is evidence that NESB immigrants have higher participation rates in education and training which partially explains their lower initial labour force participation rates.

The lower part of Figure 10 shows the predicted profiles for women. They differ from the male profiles in a number of aspects. Firstly, participation rates were generally at least 20 percentage points lower. Secondly, the life-cycle pattern was more pronounced. Thirdly, the qualification level had a larger predicted effect on participation rates. Fourthly, differences between immigrants and natives were larger, and it took immigrant women about 15 years until their participation rates converged to, or approached, those of natives. Finally, the ESB/NESB difference in participation patterns was less prominent for women than for men.

The same type of analysis can be repeated for employment rates. Figure 11 shows predicted employment probabilities, conditional on participation in the labour market. Hence, one minus the employment rate gives the unemployment rate. Employment rates of New Zealand born men were up to 10 percentage points higher than those of just arrived ESB immigrants, and more than 20 percentage points higher than those of just arrived NESB immigrants. Convergence rates were relatively high, in particular for NESB migrants with a university qualification, and after 10 years only NESB

school graduates were left with a sizeable gap. Among women, the estimated entry gap was much larger among those who came from a non-English background country. However, their relative improvements were fast with convergence or "near"-convergence after ten to fifteen years.

Several general conclusions can be taken from this analysis. The pooled regression approach provides a useful tool for disentangling entry and convergence effects. It can be equally well applied to the analysis of relative incomes, participation rates, or employment rates. In either case, inferring convergence rates from cross-section data alone would lead to overly optimistic conclusions, as the rate of progress would be overstated. Nevertheless, even the pooled analysis showed ample evidence for integration of immigrants. A "typical" immigrant arrived with an income shortfall of about 20 percent relative to a similar native that disappeared after 20-30 years of residence. The differences in participation and employment rates tended to disappear faster, after 5 to 15 years in most cases. Not all groups were equally successful, however. Less skilled immigrants from NESB countries, mostly Asia and the Pacific Islands, were shown to have outcomes below those of similar natives permanently or for long periods of time. UK and Irish immigrants, by contrast, "outperform" the similar New Zealand born persons soon after arrival.

Finally, highly qualified immigrants were more likely to reach income parity with qualified natives than were less qualified immigrants (with less qualified natives). The specific effect of qualifications on the adjustment profiles varied for different groups of immigrants. In particular, more qualified ESB migrants had a *smaller* entry disadvantage and *slower* subsequent income growth than less qualified ESB migrants, whereas more qualified NESB migrants had a *larger* entry disadvantage and *faster* subsequent income growth. One possible interpretation is that the transferability of skills was higher for ESB migrants than for NESB migrants, giving the former group a higher return to skills upon arrival.

## 5 Performance Factors

So far the discussion was concentrated on three distinct performance factors: Qualification, Years in New Zealand, and Region-of-Origin. All of them have been found to be important determinants of immigrants' relative labour market outcomes in New Zealand. In this section, we investigate the importance of a handful of additional potential performance factors.

### *The effect of age-at-arrival*

Previous overseas research has suggested that age at arrival may such an additional factor. One argument is that immigrants who arrive at young ages are more likely to be educated at host country schools, and the skills they learn there are more highly valued in the host country labour market, and overall they are more likely to "look like natives". Translated into relative age-income profiles, this would suggest a smaller initial entry disadvantage combined with smaller subsequent relative income growth for immigrants who arrived at younger ages relative to immigrants who arrived at older ages. To make this a valid comparison, one has to account for the fact that there tends to be a negative correlation in the sample between age-at-arrival and period of residence.

The specific effect of age at arrival on relative incomes can be estimated from a general model in which immigrant and native age-income profiles are determined independently. For natives the profiles are modelled as usual by  $age$  and  $age^2$ , whereas for immigrants, two additional terms  $age_{im}$  and  $age_{im}^2$  are included in order to allow the age polynomial coefficients to differ between natives and immigrants. But since for immigrants  $age_{im} = age-at-arrival (aaa) + years\ since\ migration (ysm)$ , we effectively include  $(aaa+ysm)$  and  $(aaa+ysm)^2$ . In order to single out the separate contributions of  $aaa$  and  $ysm$ , we expand the polynomial and include as final regressors  $aaa$ ,  $ysm$ ,  $aaa^2$ ,  $ysm^2$ , and  $aaa*ysm$ .

Based on the regression results, we then compute the entry differential (i.e., for  $ysm = 0$ ) of someone arriving at the ages of 15, 25, and 35, respectively, and the relative income position after 10 years of residence for those immigrants (as well as the relative position of an immigrant who arrived ten years earlier at the age of 5). A set of typical results is given in Table 4.

**Table 4: Log-income differential between male immigrants and natives of same age, by age-at-arrival and years in New Zealand.**

	ALL	ESB	NESB
Arrival at age 15:	-0.161	-0.170	-0.113
Arrival at age 25:	-0.258	-0.184	-0.314
Arrival at age 35:	-0.298	-0.171	-0.425
Arrival at age 5 after 10 years:	-0.028	-0.054	0.046
Arrival at age 15 after 10 years:	-0.141	-0.086	-0.166
Arrival at age 25 after 10 years:	-0.198	-0.091	-0.290
Arrival at age 35 after 10 years:	-0.197	-0.068	-0.323

*Note: Regressions include cohort dummies, period effects, sch, voc, uni, hours, age, agesq, aaa, ysm, aaaysm, aaasq and ysm sq.*

The results confirm that age-at-arrival is an important performance factor. The male entry income disadvantage is 16 percent for a 15 year old, but 30 percent for a 35 year old. Similarly, the relative income of a 15-year-old is predicted to increase by 2 percentage points over the next ten years, compared to 10 percent for the 35-year-old. As a result, relative incomes of immigrants who arrived at different ages do converge over time. The effect of age-at-arrival is substantially more pronounced for immigrants from non-English speaking countries, which suggests that they have more to gain from an "early" integration.

While we do not observe children under the age of 15 directly in our sample of working-age immigrants, we observe them when they become of working age. It turns out that a fifteen-year-old immigrant who arrived as a five-year-old "looks very much like" a fifteen-year-old native. In the case of male immigrants from non-English speaking countries, the predicted relative income exceeds the income of a 15-year-old native by 4 percent. This finding suggest a particular benefit from arriving in New Zealand as a child. It also suggests the absence of persistent income differentials along the lines of English background.

### *The effect of cohort-size*

The size of an arrival cohort might be negatively related to its relative labour market outcome. For instance, if labour markets are segmented and there is a shortage of jobs, a larger number of immigrant arrivals might *ceteris paribus* reduce the labour market incomes for this cohort. This argument, if correct, could provide a partial explanation for the large income entry differential of the relatively large cohort of recent Asian immigrants in 1996. In addition, this hypothesis has important policy implications as the immigration intake in each year can be influenced by policy settings.

**Fig 12. Relative Cohort Size and Entry Differential**

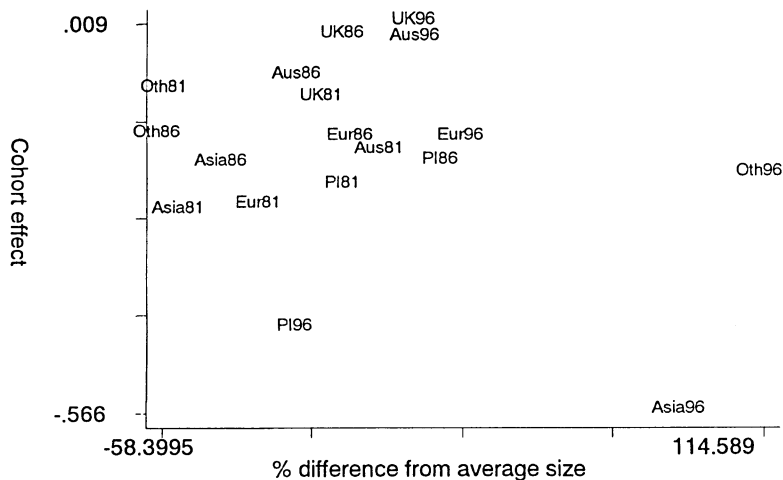


Figure 12 combines information on the cohort sizes of 76-80 arrivals in the 1981 Census, 81-85 arrivals in the 1986 Census, and 91-95 arrivals in the 1996 Census, by region of origin, with the estimated log-income differentials for those cohorts from model (1). Sizes are measured relative to the average number of employed recent immigrants over the 3 Census years, separately for each region. It is evident that there was no simple relationship, and no negative relationship in particular, between relative cohort size and income differential. The Asian observation point for 1996 is

an outlier. Similar results are obtained, if we plot income differentials against the relative cohort sizes of all immigrants (rather than employed immigrants only).

### *The effect of language proficiency*

The 1996 Census provided some direct information on English proficiency. Table 5 gives selected results and analyses the interaction with the ESB/NESB variable. We find that English proficiency had a large effect on the relative incomes of immigrants. Proficient immigrants' incomes exceeded those of otherwise similar non-proficient male immigrants by 37 percent. One possibility is that the proficiency variable, through its correlation with country of origin, merely captures differences in unobserved characteristics of immigrants with different countries of birth. The next column of the Table includes "Born in an English-speaking country" (i.e., ESB) in addition to actual proficiency. The coefficient on proficiency now measures the specific effect of language proficiency, holding the immigrant's English background constant. The coefficient is somewhat reduced in size but remains at about 30 percent large.

**Table 5: English proficiency and English Speaking Background (Standard errors in parentheses)**

Proficient in English	0.370 (0.010)	0.298 (0.010)	0.305 (0.010)
ESB		0.212 (0.004)	0.435 (0.059)
Proficient * ESB			-0.224 (0.060)

*Note: Regressions include cohort dummies, highest qualification, hours, age, and age squared.*

In addition, ESB has an independent effect of 21 percent. The ESB coefficient picks up effects that are unrelated to actual proficiency but rather reflect differences in other performance factors that are associated with country-of-birth. Those other factors might include cultural characteristics, differences in educational quality, "Western" style education, differences in linkages to the New Zealand labour market, and other characteristics that aid or hinder labour market integration. Are the effects



of proficiency and ESB cumulative? The next column of Table 5 includes an interactive term for those immigrants who are both proficient and have ESB. The interactive term is negative, indicating that the returns to proficiency are larger for NESB migrants than for ESB migrants, or equivalently, that the returns to being an ESB are larger for non-proficient migrants than for proficient migrants. Proficiency and ESB status have some degree of substitutability and we can compute the returns to proficiency as approximately 31 percent for NESB and 8 percent for ESB migrants.

While English proficiency is an important factor at the individual level, there is another question, namely whether proficiency can partially explain the decline in the performance of the latest arrival cohort. It is both possible and plausible that a lower proficiency rate of 1996 recent immigrants, relative to previous cohorts immediately after arrival, contributed partially to the decline in their relative labour market outcomes. However, we have no way of empirically validating this possibility, as the proficiency question was asked only once, in the 1996 Census.

*Compositional effects and the declining relative incomes of the 91-95 NESB cohort.*

Throughout this paper we have found evidence for systematic differences between the cohort of immigrants who arrived between 1991 and 1995, and previous cohorts. Was the decline in the relative labour market outcomes of Asian and Pacific Island immigrants associated with shifts in the country-of-origin mix of the migrant inflows from those regions?

In the case of Asia, there is some empirical support for this hypothesis. In the 1990s, an increasing share of immigrants came from North Asian countries. Migrants from those countries had relatively low employment rates and incomes in 1996. Consider the following decomposition exercise: There were 14 Asian origin countries with at least 1000 immigrants in one of the Census years. Table 6 gives the adjusted income differentials for recent immigrants from each country in both 1986 and 1996. As previously, the adjustment controls for age, age squared, qualification and gender. x

gives the number of immigrants from a specific country as a proportion of all recent Asian immigrants.

**Table 6. Adjusted income differentials for recent Asian immigrants, 1986 and 1996.**

	1986 Log- Income Differential	1986 Share (x)	1996 Log- Income Differential	1996 Share (x)
Kampuchea	-0.089	0.180	-0.239	0.012
Indonesia	-0.205	0.031	-0.445	0.014
Malaysia	-0.361	0.086	-0.437	0.065
Philippines	-0.449	0.091	-0.551	0.076
Singapore	-0.189	0.038	-0.285	0.015
Thailand	-0.202	0.012	-0.421	0.024
Vietnam	-0.114	0.085	-0.390	0.016
China	-0.256	0.122	-0.721	0.209
Hong Kong	-0.222	0.056	-0.476	0.083
Japan	0.208	0.113	-0.197	0.104
Korea	-0.922	0.040	-0.732	0.167
Taiwan	-0.034	0.005	-0.652	0.057
India	-0.253	0.111	-0.500	0.113
Sri Lanka	-0.055	0.025	-0.386	0.039

The overall change in the recent Asian-native log-income differential is given by

$$\text{coeff}_{96} * x_{96} - \text{coeff}_{86} * x_{86} = -0.545 - (-0.201) = -0.344$$

How much of this change is due to changes in composition, and how much to changes in country-specific differentials? Using the regression results, the change in the overall recent Asian-native income differential can be decomposed as follows

$$\text{coeff}_{96} * x_{96} - \text{coeff}_{86} * x_{86} = \text{coeff}_{96} * (x_{96} - x_{86}) + x_{86} * (\text{coeff}_{96} - \text{coeff}_{86})$$

The first term on the right side gives the effect due to a change in composition, evaluated at the 1996 differentials. With the above numbers,  $\text{coeff}_{96} * x_{86} = -0.431$ . Hence, the change in composition explains an increase in the (recent) Asian income differential of 0.114 percentage points, or about one third of the actual increase. Alternatively, we could evaluate the change in composition using the 1986

differentials. With  $\text{coeff}_{86} * x_{86} = -0.310$  we find that 0.109 percentage points of the actual change, again about one third, are explained by compositional effects.

The other two-thirds of the increase were associated with increases in the entry income differentials for recent immigrants from specific countries. We cannot tell from our data whether these changes were caused by changes in unobserved characteristics (either quantity or returns) within countries, or by changes in the receiving conditions in the NZ labour market. Note that the income differentials of recent immigrants (adjusted for native-immigrant demographic differences, and partially adjusted for level of economic activity) increased for *every* Asian country, with the exception of Korea. Yet the rank order of Asian nations, ordered in terms of size of the income differentials, did not change all that much. Thus, the influence of unmeasured or uncontrolled country-specific factors on labour market outcomes had some important persistent components.

## 6 Conclusions

This study used the 1981, 1986, and 1996 Population Censuses as observation points in order to

- (i) compare the labour market outcomes of immigrants immediately after arrival in New Zealand and in subsequent years with those of similar New Zealand born individuals,
- (ii) identify the factors associated with differences in labour market outcomes, and
- (iii) identify and explain changes in the relative labour market outcomes of immigrants between 1981 and 1996.

Over time, all immigrants can be expected to reach, or at least approach, the labour market outcomes of similar New Zealand born persons. The estimated time to convergence in participation and employment rates was at 5-15 years relatively fast for most groups of immigrants. Income convergence is predicted to take about twice as long. Among non-English speaking background immigrants in particular, there is support for the hypothesis that part of the initial shortfall in labour market outcomes

is associated with the specific problem of transferring their skills and making their true value of their qualifications credibly known to New Zealand employers.

One important finding was the changing fortune of the most recent observable cohort of immigrants, those who arrived in the first half of the 1990s. After controlling for the various factors that potentially affect relative incomes, such as age, education, and the level of economic activity, we find that English background immigrants improved their position relative to previous arrivals, whereas Asian and Pacific Island immigrants had substantially lower relative incomes than previous arrivals. It is too early to assess whether this trend toward an increasing disparity will continue.

One possible explanation could be that changes in the labour market, such as a decline of the manufacturing sector and an increasing importance of personal and business services, might have favoured immigrants from countries that share both language and cultural background of the New Zealand society. Alternatively, one might look at the possible effects of the substantial reforms in immigration policy and the introduction of a point system in 1991. The lack of a counterfactual and the limited information available in Census data would make such an endeavour highly speculative. Having the benefit of one additional post-reform observation point from the next Census will be important. It is clear, however, that immigrants arriving in the first half of the 1990s had a relatively high level of formal qualifications. It is also true that the factors for which points are awarded, such as education, age-at-arrival, age are important determinants of an immigrant's success in the New Zealand labour market, as is English proficiency.

We conclude with a caveat. It was the purpose of this paper to analyse only one particular aspect of the economic benefits of immigration to New Zealand, namely their labour market outcomes. This is not to deny the existence of many other aspects that are equally worthwhile of study and potentially even more important for the fortunes of New Zealand's society. Examples for other issues are how immigration affects the labour market outcomes for New Zealand born workers, and increased cultural diversity might benefit the country.

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## Appendix

Example for regression results for pooled model, male immigrants and natives, by English background.

	English Background		Non-English Background	
	Coef.	StdErr.	Coef.	StdErr.
Cohort Pre-1960	-.3318	.0217	-.3432	.0209
Cohort 1961-65	-.2648	.0189	-.2877	.0179
Cohort 1966-70	-.2484	.0169	-.2873	.0155
Cohort 1971-75	-.2148	.0144	-.2659	.0126
Cohort 1976-80	-.2324	.0129	-.3102	.0105
Cohort 1981-85	-.1987	.0131	-.2774	.0103
Cohort 1986-90	-.1371	.0145	-.3199	.0102
Cohort 1991-95	-.0753	.0148	-.4636	.0122
1986 Census	.6419	.0316	.8534	.0349
1996 Census	.1718	.0323	.3587	.0345
Y in NZ	.0165	.0013	.0083	.0012
" * School	-.0024	.0012	.0075	.0012
" * Vocational	-.0051	.0011	.0023*	.0012
" * University	-.0130	.0013	.0187	.0014
Y in NZ sq/100	-.0174	.0021	-.0017*	.0022
" * School	.0055	.0026	-.0108	.0029
" * Vocational	.0074	.0023	-.0038*	.0029
" * University	.0309	.0029	-.0261	.0034
Hours of work	.0114	.0002	.0127	.0002
" * 1986	-.0044	.0002	-.0054	.0003
" * 1996	.0017	.0002	-.0006	.0002
Age	.1148	.0011	.1071	.0013
" * 1986	-.0005*	.0016	-.0102	.0018
" * 1996	.0259	.0017	.0203	.0018
Age squared/100	-.1245	.0015	-.1169	.0017
" * 1986	-.0017*	.0020	.0102	.0023
" * 1996	-.0308	.0021	-.0241	.0023
School qual.	.1328	.0086	.1035	.0088
" * 1986	.0033*	.0117	.0107*	.0118
" * 1996	.0397	.0120	.0707	.0124
" * Immig.	.0223*	.0172	-.0047*	.0166
" * Immig. * 1986	-.0005*	.0136	-.0448	.0153
" * Immig. * 1996	-.0467	.0153	-.1162	.0164
Vocational qual.	.2499	.0087	.2371	.0089
" * 1986	-.0169*	.0112	.0029*	.0113
" * 1996	-.0158*	.0121	.0246	.0124
" * Immig.	.0318*	.0165	.0373	.0185
" * Immig. * 1986	.0256	.0124	-.0275*	.0160
" * Immig. * 1996	-.0089*	.0148	-.0626	.0176
University qual.	.4912	.0153	.4798	.0156
" * 1986	.0364*	.0200	.0596	.0204
" * 1996	.0643	.0194	.1053	.0199
" * Immig.	.0851	.0225	-.1118	.0237
" * Immig. * 1986	.0146*	.0233	.0037*	.0258
" * Immig. * 1996	-.0099*	.0234	-.0698	.0251
Male				
Male * 1986				
Male * 1996				
R-squared	0.449		0.415	

Note: \* indicates coefficients that are *insignificant* at the 0.05 level.

Figure 9. Age-Income Profiles of Immigrants and Natives, by English Background and Sex.

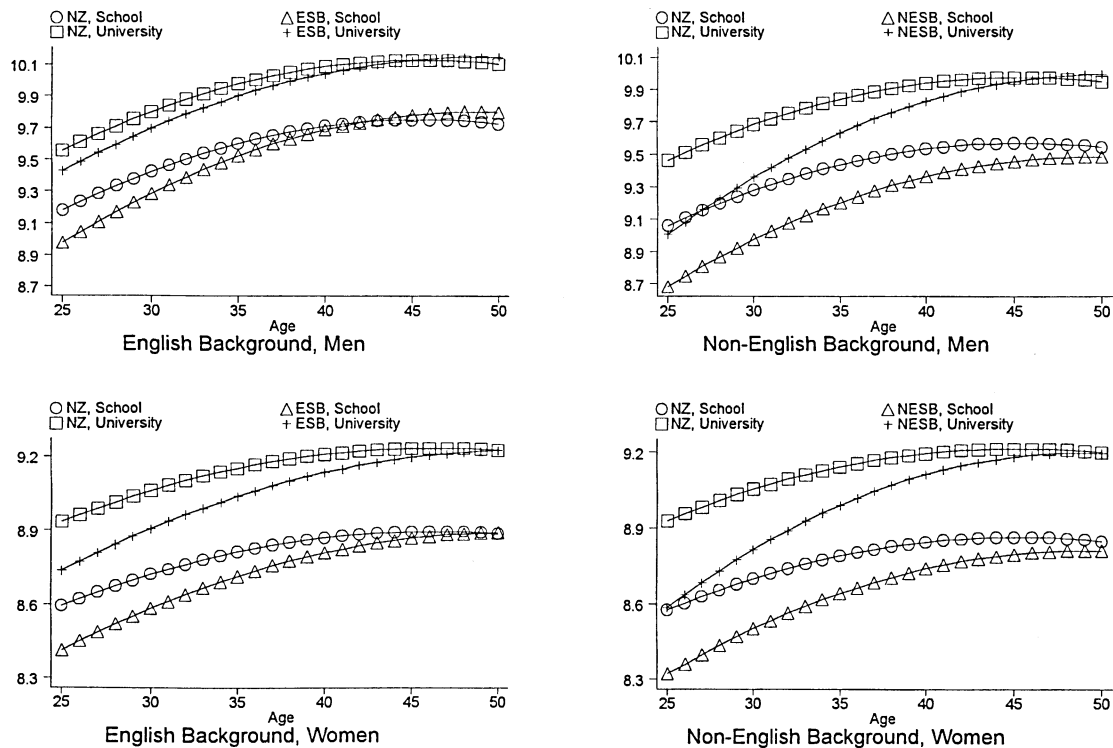


Figure 10: Age-Participation Profiles, by English Background and Sex.

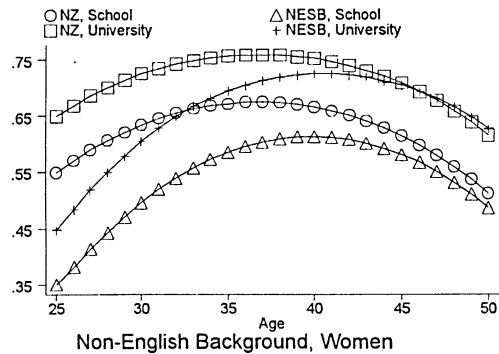
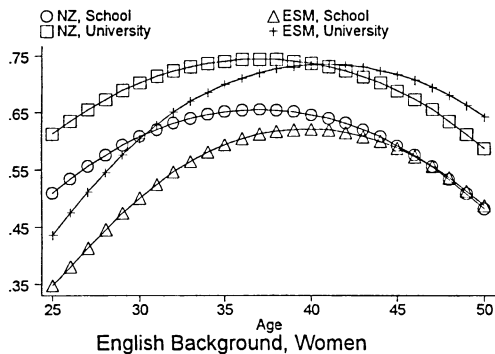
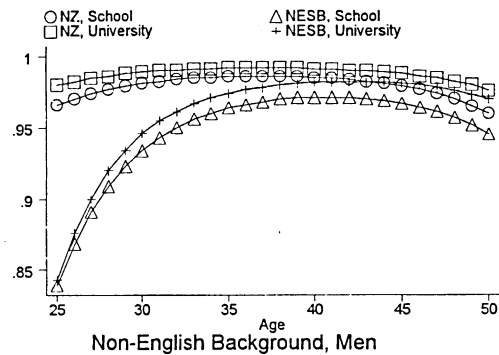
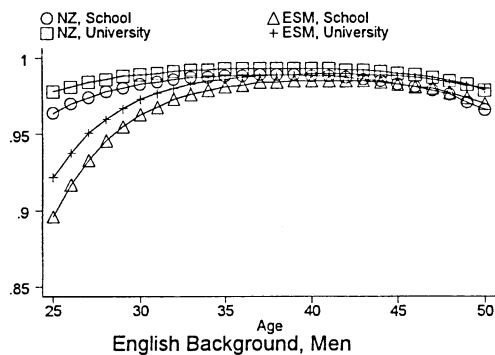
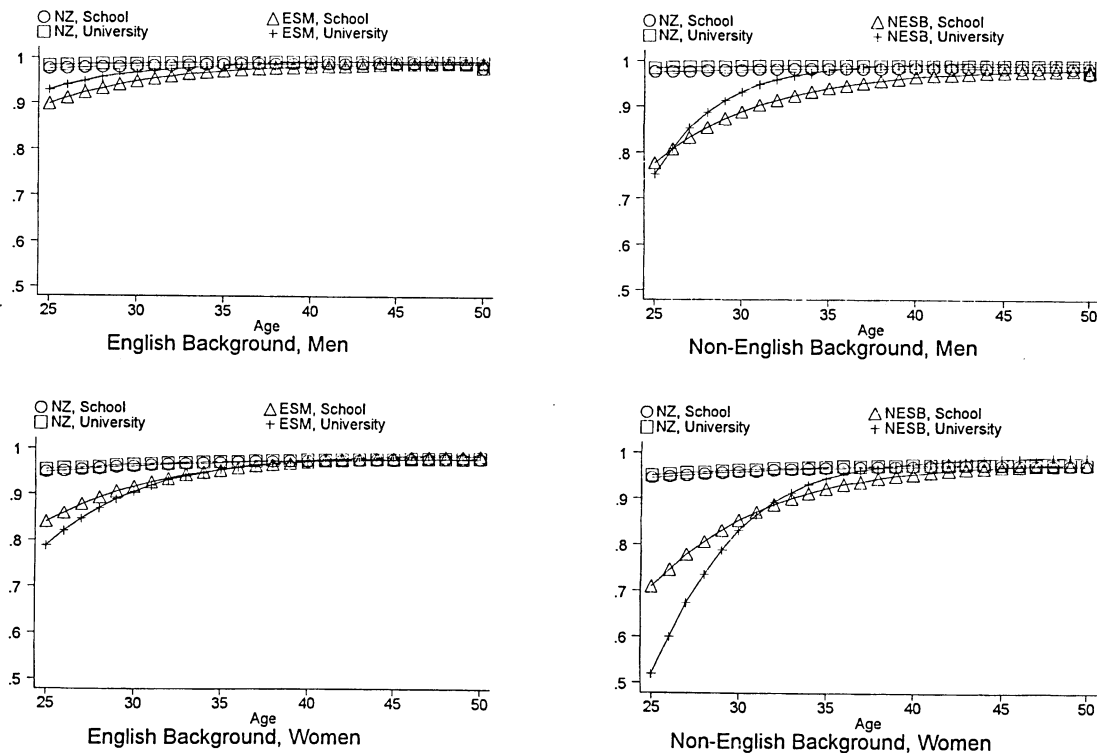




Figure 11. Age-Employment Profiles, by English Background and Sex.



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