

Explaining patterns of disparity between Māori and non-Māori employment chances

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This article considers the causes of the time series pattern of employment rate disparity between Māori and non-Māori. It offers important cautions regarding the focus of disparity analysis on average group outcomes and presents evidence that intra-ethnic group variation overwhelms inter-ethnic group variation. The overlap between labour market disadvantage and Māori ethnicity is extremely weak. The article offers evidence of considerable ethnic fluidity, which raises the possibility that, rather than Māori ethnicity causing poor outcomes, poor outcomes could cause Māori ethnicity. The article offers evidence that the time series pattern of disparity cannot be explained by changes in relative ages or educational qualifications of the Māori population, nor by racial discrimination. Rather, there is evidence that Māori were located in sectors of the economy that received a disproportionately large negative employment shock in the late 1980s. Some of the reduction in disparity in Māori rates of employment post-1990 is due to sluggish Māori labour market adjustment following the shock. Convergence is also caused by rising Māori educational endowments and age compared with non-Māori, and a growing share of mixed Māori, who are more successful in the labour market than sole Māori, within the Māori ethnic group.

Introduction

AN EARLIER STUDY, 'Time Series Analysis of Disparity between Māori and non-Māori Labour Market Outcomes', found that the best simple measure of labour market disparity between Māori and non-Māori was the percentage point difference in employment rates (Chapple and Rea, 1998). This disparity number measures differences in employment chances between a randomly selected Māori group of working age and a similarly selected non-Māori group of working age.

The time series of employment rate disparity showed a 2 to 5 percentage point difference in employment rates between the non-Māori and the Māori ethnic groups between 1985 and 1987. Thereafter disparity rose sharply, peaking at 14.0 percentage points in September 1992. Since this 1992 peak, employment disparity has fallen markedly by 9.1 percentage points to a current figure of 5.9 percentage points (latest figure: March 2000) – a level of disparity last achieved in 1987. More sophisticated measures of disparity gave a similar time series pattern of the dynamics of labour market disparity.

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Using employment rate data to examine labour market disparity is more sensible than using unemployment or labour force participation rate data for two major reasons – one economic and the other statistical. The statistical reason is that there is less error in employment rate data because more people are employed in each ethnic group than are either out of the labour force or unemployed. In addition, a focus on unemployment rates, rather than employment rates, misses those who have dropped out of the labour force. Because the employment rate is a simple function of participation and unemployment rates, variation in employment rates between groups captures information from variation in both unemployment rates and participation rates between groups.²

It has been suggested that differences in employment rates are not the single best measure of labour market disparities and that differences in unemployment rates or jobless rates are better.³ The reasoning is that employment rate differences may be driven by increases in relative Māori education participation or in the provision of childcare, both of which are beneficial. This is of course possibly true. However, education and childcare could also be undertaken as next best options as individuals, who cannot find work, withdraw from the labour force. In other words, those undertaking education or childcare could also be discouraged workers that the unemployment rate or jobless rate disparity measures miss.

At the same time, Chapple and Rea (1998) show that various more complex indexes of differences in three labour market states (employment, unemployment and not in the labour force) have time series patterns that are very similar to simple percentage point differences in employment rates. Differences in employment rates are therefore simpler but highly informative of overall trends.

Employment rate gaps do, however, capture a great majority of information in unemployment rate gaps: the correlation between the level of unemployment rate gaps and the level of employment rate gaps for Māori and non-Māori is very high ($r=88.5$ percent) reflecting strong similarities in the time series patterns. In terms of the slight differences in time series patterns, employment rate disparity

² The employment rate is the product of the labour force participation rate and one, less the unemployment rate.

³ The suggestion came from an anonymous referee. The same referee also suggested that differences between employment rates could also reflect lifestyle choices, whereas differences between unemployment rates do not, because people who are unemployed actually want a job but do not have one. However, gaps between Māori and non-Māori unemployment rates could also reflect choices if, for reasons of lifestyle, unemployed Māori expend less time, effort and money seeking work than non-Māori. If lifestyle choice is an important driver of disparity, it is hard to justify the observed time series patterns of differences between mixed and sole Māori, and Māori and non-Māori, by independent changes in cultural lifestyle choices. For these reasons it is unlikely that much observed labour market disparity is driven by differences in cultural preferences between Māori and non-Māori. Disparity thus remains an interesting policy issue.

grew more rapidly over 1985–1987, when unemployment disparity was stable. Unemployment disparity fell more rapidly over the upswing of 1992 to 1996, rose mildly over the recession from 1996 to 1998, when employment rate disparity was roughly stable, and fell sharply in late 1999.

Lastly, given that there is concern regarding disparity between Māori and non-Māori income, it is worth noting that a reduction in employment disparity will unambiguously reduce annual income disparity, whereas reductions in unemployment rate disparity could merely reflect relative Māori labour market withdrawal.

This paper thus adheres to the conclusion of Chapple and Rea (1998) that the employment rate gap is the best single indicator of Māori labour market disparity. However, while employment rate gaps may be the simple best indicator, it is acknowledged that there is no such thing as the single perfect indicator.

Our earlier study offered only a few tentative hypotheses regarding the causes of the observed fluctuations in the pattern of disparity. This paper addresses in more detail the causes of the observed time series pattern in Māori/non-Māori labour market disparity, as summarised in differences in employment chances. The approach here is descriptive and seeks to use the variation observed in the data across time, between the sole and mixed Māori sub-sets of the Māori ethnic group, within the non-Māori group, and between occupations, industries and regions to obtain information on plausible hypotheses explaining employment disparity.⁴

Ideally a multi-variate approach utilising unit data would probably yield the most information on the time series development of disparity. However, the cross-tabulations approach utilised below should at least be able to narrow the range of plausible explanations regarding the causes of employment rate disparity.

What are these explanations? Some are supply-side explanations, considering explanatory variables like educational qualifications, age, and population growth. Others focus on the demand side, considering possibilities like rising discrimination in the labour market or structural shocks to the pattern of labour demand.

As educational qualifications are a key factor in obtaining jobs, one possibility is that, relatively speaking, Māori have been falling behind non-Māori in acquiring educational qualifications and this has caused the observed rise in disparity. The belief in a growing educational gap is a staple in the writings of many educationalists. Another possibility is that the Māori population has been becoming relatively younger than the non-Māori population. Because age is

⁴ Splits by gender are also possible. However, gender patterns of employment disparity between Māori and non-Māori were very similar. Gender splits thus added little additional information to an analysis of causes of Māori labour market disparity. Ockham's razor was applied and entities were not multiplied needlessly.

another key determinant of employment chances, this has caused the employment gap to rise. A third related explanation is that the Māori population is growing at a more rapid rate than the non-Māori population. The labour market cannot expand at a sufficiently rapid rate to absorb the Māori newcomers. Again, the consequence is greater disparity in employment chances. All of these are supply-side explanations.

There are several demand-side explanations. Discrimination is often considered to explain a proportion of Māori labour market disadvantage. If labour market discrimination has been worsening over time, this could cause rising disparity in employment chances. Another potential explanation is that technological change and liberalisation of the economy has resulted in a structural shift that disadvantages those with certain skill sets. If Māori are over-represented amongst those with these skill sets, then this too can potentially explain growing disparity.

The supply- and demand-side explanations are examined in turn below. Before this is done, the paper discusses a very important limitation of the type of disparity analysis undertaken here (eg, Te Puni Kōkiri, 1998; Chapple and Rea, 1998). In addition, the paper considers the mixed and sole Māori distinction employed in this study.

Variances in outcomes within ethnic groups: the moment of truth

The first moment of any distribution is its average or mean. Average differences, or differences in first moments between Māori and non-Māori ethnic groups, have been the focus of disparity analysis. However, there are other higher moments that also describe the distribution of outcomes. The second moment of the distribution, the variance or spread of outcomes, is in some circumstances a highly informative measure of group outcomes.

By focusing simply on the first moment of the distribution, the average differences in employment chances between non-Māori and Māori – as this study and other studies of disparity do – a picture is created whereby Māori ethnicity is perceived as a very good predictor of socio-economic failure.

Is this picture in fact true? Are first moments of the distribution a good summary of the socio-economic differences between Māori and non-Māori? If first moments of the distribution of socio-economic differences are good summaries of differences between Māori and non-Māori, and intra-group second moments (variances) are small, a simple regression of a binary Māori variable on any socio-economic outcome will have a high degree of explanatory power as measured by the fit of the regression (the R^2). Note that the power of Māori ethnicity alone to explain outcomes reflects all the reasons why the Māori ethnic group may have different labour market and other outcomes – differences in demographic structure, regional location and mobility, information sets, racial discrimination, differences in educational qualifications and literacy – literally the lot.

The fact that Māori ethnicity consigns individuals to non-employment is far from the truth. A logistic regression explaining variations in employment chances by Māori ethnicity alone gives a pseudo R^2 of 0.15 percent. In other words, 99.75 percent of the variation in employment chances between people are not explained by Māori ethnicity either directly, by say racial discrimination, different labour market networks, or different attitudes to paid work, or indirectly, by say different age, education, or regional distributions.⁵

Intra-Māori and non-Māori ethnic group variation in employment chances dwarves inter-group variation. While this study concentrates on explaining the first moment of the distribution, or average differences in employment chances between Māori and non-Māori ethnic groups, it acknowledges the existence of very large second moments of the distributions, or the large intra-ethnic group variation in employment chances. Māori ethnicity is not employment destiny.

Similarly, nor is Māori ethnicity earnings destiny. While the Māori ethnic group average hourly earnings shortfall is almost always statistically significant, the average amount of earnings variation explained directly and indirectly by Māori ethnicity is less than one-half of 1 percent (see Table 1 below). The highest explained variation for any single year is seven-tenths of 1 percent. Again, intra-

TABLE 1: Explanatory power and statistical significance of binary Māori variables for log hourly earnings

<i>Year</i>	R^2	<i>T statistic</i>
1984	0.0043	-4.121
1985		
1986	0.0007	-1.606
1987		
1988	0.0033	-3.914
1989		
1990	0.0030	-3.167
1991		
1992	0.0039	-3.267
1993		
1994	0.0053	-4.019
1995	0.0041	-3.488
1996	0.0072	-4.651
1997	0.0046	-3.722

Note: The regressions use *Household Economic Survey* data and involve a simple regression of a binary Māori variable on log hourly earnings. *No other explanatory variables are employed.* I thank my colleague Sylvia Dixon for undertaking the regressions for me.

⁵ This simple regression uses employment status and ethnicity data from the 1997 *New Zealand Health Survey*.

Māori ethnic group variation swamps inter-group variation. The boundaries of the Māori ethnic group and labour market disadvantage are a long way from coterminous.

Māori ethnicity has similar weak predictive power (again about one-half of 1 percent) for annual earnings using the Ministry of Education's adult literacy data set. Considering the explanatory power of Māori ethnicity for log annual personal income, the 1996/97 *Health Survey* reveals a similar fit of 0.36 percent. Compare this with the explanatory power of other variables entered singly in a regression and earnings are explained as follows: 6.13 percent for being female, 0.75 percent for being disabled, 1.87 percent for being married, and 6.67 percent for combining a school and a tertiary qualification. Age and its square explain 10.40 percent of personal income variation.⁶

Thus, Māori ethnicity is a very poor predictor of employment and earnings outcomes, both in an absolute sense and also relative to other commonly used explanatory variables.⁷

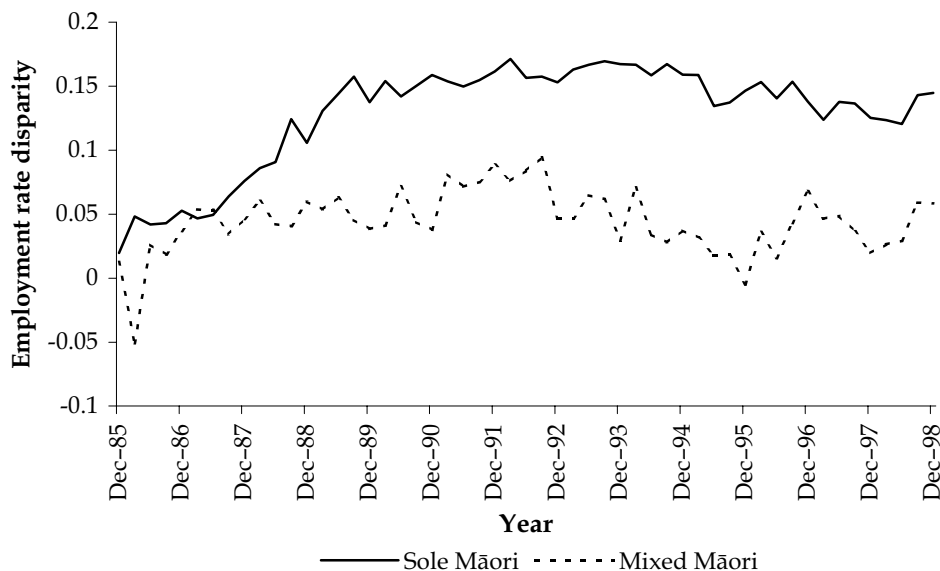
Mixed Māori, sole Māori and ethnic fluidity

The earlier study also showed that there were substantial differences within the traditionally defined Māori ethnic group – cross-sectionally and over time (see Figure 1 below). Most of the variation in Māori ethnic group disparity has been driven by fluctuations in the employment chances of the sole Māori group (those who respond only Māori in the ethnicity question) compared with non-Māori. Employment rate gaps between mixed ethnicity Māori (those who respond Māori and any other ethnic group to the ethnicity question, currently 28 percent of the Māori ethnic group) and non-Māori were generally lower and more stable than for sole Māori.⁸ In fact, employment outcomes of the mixed Māori group are closer to those of non-Māori than to sole Māori.

⁶ The point being made here in the text and in footnote 4 above has a family resemblance to arguments made by some commentators that disparity analysis risks stereotyping Māori as socio-economic failures.

⁷ An anonymous referee has remarked that "Māori ethnicity is a major factor in employment outcomes". While Māori labour market outcomes tend to be significantly different from non-Māori on average, the main point this section makes is large intra-group variances and the related poor absolute and relative explanatory power of Māori ethnicity for outcomes suggests the opposite: Māori ethnicity is not a major factor in employment outcomes. Further supporting this position are large differences between mixed and sole Māori and the fact that in a multi-variate setting the size of the average Māori penalty for earnings and employment chances is much reduced and not infrequently rendered statistically insignificant (see Winkelmann and Winkelmann, 1997; Chapple and Maré, 2000 for examples).

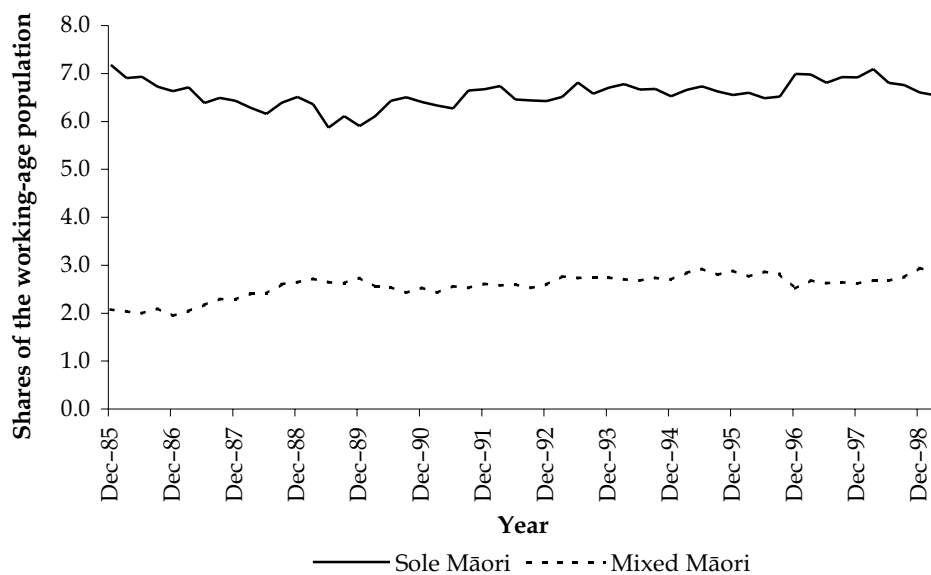
⁸ If one can view the sole/mixed Māori choice as an indicator of the strength of Māori identity, observed differences in employment prospects between the two Māori groups runs counter to the suggestion sometimes heard that a greater Māori cultural identification is associated with better socio-economic, including employment, outcomes (see Maynard *et al*, 1999, p 49 for a short summary of this viewpoint).

FIGURE 1: Employment rate disparity between Māori and non-Māori

Why consider mixed Māori separately from sole Māori? The primary reason from the point of view of this note is that differences between sole and mixed Māori are an important intra-Māori ethnic group variance that has potential to inform researchers on the validity of various hypotheses explaining the overall level and pattern of disparity.⁹

Unlike the census, where the ethnicity question changes significantly over the 1981, 1986, 1991, and 1996 censuses, the *Household Labour Force Survey* (HLFS) has retained the same ethnicity question since its inauguration in December 1985. An additional ethnic category was added to the question in 1990, but this impacted on the boundary between the Other ethnic group and the Pacific Island ethnic group, and not on the Māori ethnic group. Thus, changes in numbers of those in broad Māori and non-Māori ethnic groups or in mixed and sole Māori groups almost certainly do not reflect questionnaire changes.

⁹ An anonymous referee has pointed out that “under a Treaty analysis, the government is obliged to improve the current labour force status of all who identify themselves [as] Māori whether they are sole or mixed, and especially those Māori most in need”. Unless socio-economic disadvantage is shared equally amongst all Māori, and it is not, it is necessary for an analysis from a Treaty of Waitangi perspective to consider differences in disparity for Māori sub-populations. The aim of this paper is to explain why Māori are, on average, less likely to be employed and why this has varied over time. Any data variation relevant to explaining patterns of Māori/non-Māori employment differences will thus be used.

FIGURE 2: Sole and mixed Māori shares of the working-age population

The sole Māori share of the population fell over 2 percentage points between 1985 and 1989. It is possible that this decline is picking out the sole Māori who are leaving New Zealand, possibly for Australia, as a consequence of their strongly declining employment prospects (the correlation between the level of the sole Māori employment rate and their relative share of the working-age population is 26.3 percent; over the 1985.4 to 1989.4 period it is 83.6 percent). Thereafter there is some steady recovery in the share from around 6.0 percent to around 6.5 percent of the working-age population. The mixed Māori share rose almost a percentage point between 1987 and 1989 and has thereafter increased at a steady rate. The rise in the mixed Māori share may reflect category migration from the sole Māori group, which, as has been shown, was shrinking over the 1987–1989 period (the correlation between the level of the sole Māori population share and the mixed Māori share is -12.1 percent. Over the 1985.4 to 1989.4 period it is -78.5 percent).

Longer-term rises in the share of the mixed Māori population in the total Māori ethnic group (from around 22 percent of the Māori ethnic group in 1985 to around 30 percent in 1999) are likely to reflect two factors. These factors are category migration from the non-Māori population into the mixed Māori group and population growth of mixed Māori due to children of Māori/non-Māori relationships who identify with both Māori and non-Māori ethnic groups. Inter-marriage by members of the Māori ethnic group is very high: nearly seven out of 10 (66 percent) of the younger (24–34-year-old) part of the measured Māori ethnic group who are married/de facto are married to a member of the non-Māori

group (1996 census figures from Callister, 1998, Table 10). The majority of Māori ethnic group children growing up today are likely to have a non-Māori parent. The growing share of the mixed Māori population in the Māori ethnic group has reduced labour market disparity, because mixed Māori have better labour market outcomes than sole Māori. It is worth pointing out that high levels of intermarriage are likely to have positive implications for employment disparity and also for social cohesion.

Evidence of substantial category migration between the Māori and non-Māori ethnic groups is revealed in Statistics New Zealand's inter-censal consistency study for the 1996 census (Coope and Piesse, undated). Using a matched sub-sample from the 1991 and 1996 censuses, this inter-censal study showed that there was an inflow from the non-Māori group into the officially defined Māori ethnic group between 1991 and 1996 of 23.4 percent of the 1991 Māori ethnic group. The corresponding outflow was proportionately much lower but still relatively high at 5.7 percent. One in every four who officially measured Māori in 1996 was not Māori in 1991. One in every 20 who officially measured Māori in 1991 had exited the group in 1996. In terms of the Māori descent group, the in and outflows between 1991 and 1996 were 9.6 and 4.8 percent respectively. The large relative differences between the inflows on the identity (23.4 percent) and descent measures (9.6 percent) respectively probably represent many individuals flowing from the descent, but not the ethnicity, group into the descent and ethnicity group.

However, important changes in the census ethnicity question between 1991 and 1996 are likely to have expanded the boundary of the Māori ethnic group by placing Māori first rather than second in the list of ethnic options and by being unambiguous about soliciting multiple ethnic responses.¹⁰ Thus it is uncertain whether the large inflows into the Māori ethnic group picked up in the census study reflect true category migration into the ethnic group or simply changes in response to the new question. In addition the Statistics New Zealand study did not examine category migration between mixed and sole Māori categories. Thus the direct relevance of these census changes for changes in shares of mixed and sole Māori is uncertain.

As a consequence of 200 years of intermarriage all members of the Māori ethnic group effectively have non-Māori ancestors. As a consequence one could view the decisions to identify solely as Māori as some sort of rough indicator of

¹⁰ The greater openness of the 1996 census ethnicity question to multiple responses is likely to have been responsible for much of the major reduction in those having Māori ancestry but not ethnicity from around 80,000 in 1991 to around 56,000 in 1996. These people are likely to have migrated into the Māori ethnic group, which grew more strongly than anticipated between 1991 and 1996.

the strength of individual Māori cultural identity that may also have an inverse relationship with recent non-Māori ancestry. That said, the very large rise in numbers of mixed Māori in the 1996 census, partly as a consequence of the question change, suggests that small alterations in ethnicity questions can lead to many people shifting from the sole to the mixed Māori ethnic group. Hence, even the many people who state sole Māori as their ethnic group may have a relatively loose and contingent view of their Māori identity. The fluidity found in the census figures and the high level of intermarriage also suggests that Māori ethnicity is not primordial. Rather, it is fluid, differing in degrees of interest and commitment, conditional, contingent, constructed and constantly changing.

As a natural consequence of ethnic fluidity, it is plausible that if individuals see being Māori as a marker of socio-economic failure and being non-Māori as a marker of socio-economic success, that choice of ethnic identity may be contingent on socio-economic status, rather than vice versa. Rather than ethnicity causing outcomes as the disparity analysis implies, outcomes could cause ethnicity. In other words, a socio-economic success is less likely to identify as Māori than is a socio-economic failure. Stereotypical views of a common boundary between ethnicity and success are unintentionally promoted by most discussions of Māori disparity (eg, see Te Puni Kōkiri, 1998). These stereotypes contribute to a social climate where socio-economic performance may well determine ethnicity for some people. The stereotype is unsupported by the empirical record, as the section above demonstrates abundantly.

Can growing educational disparity explain the pattern of employment disparity?

Cross-sectional regressions that explain the probabilities of having a job indicate typically that the main supply-side characteristics strongly associated with the probability of obtaining employment are age and educational attainment. It is well known that Māori are, on average, both younger as a proportion of the population than non-Māori and have lower levels of education. These factors explain a proportion of the labour market disadvantage of the Māori ethnic group observed in cross-sectional data (eg, for Māori see Easton, 1994; Maloney, 1995 and Winkelmann and Winkelmann, 1997).

It should be noted that age differences alone cannot explain why mixed Māori have a better cross-sectional labour market performance, since on average they are considerably more youthful than the sole Māori group. However, mixed Māori are more highly educated and this in turn could explain part of their better labour market performance.

As already indicated, one explanation of growing disparity is that the gap between educational qualifications of Māori and non-Māori in the working-age

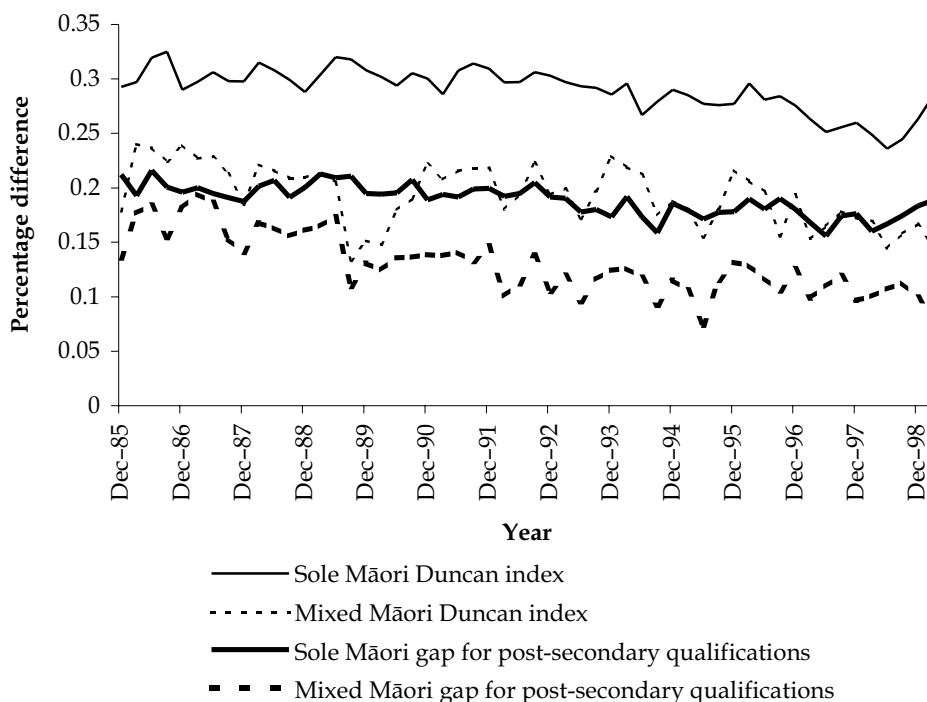
population has been widening and, consequently, Māori are becoming less likely to be employed. As already mentioned, the contention that the educational gap between Māori and non-Māori is widening is a staple story of many educationalists (see Chapple *et al*, 1997).

In Figure 3 below a summary measure of differences in educational qualifications between Māori and non-Māori populations is plotted using five measures of qualifications: no formal qualifications, school certificate in one or more subject, upper secondary, other school qualification, post-secondary qualification.

The Duncan measure of disparity (see Chapple and Rea, 1998 and Duncan and Duncan, 1955 for further discussion) shows a slow but ongoing tendency for Māori and non-Māori working age populations to converge in terms of educational endowments. The decline in the education gap of the populations is not an artifact on this particular form of measurement, as the gaps assessed: the percentage point differences in the populations with no qualifications and for post-secondary qualifications follow a similar declining pattern.

In terms of their pattern of educational qualifications, mixed Māori have a greater similarity to non-Māori than to the sole Māori group at any point in time. This greater educational similarity explains potentially why mixed Māori have

FIGURE 3: Educational attainment of Māori and non-Māori converges



employment outcomes more like non-Māori than do sole Māori. The two Māori sub-groups are converging towards non-Māori at a similar rate.¹¹

Thus, there is no evidence that supply-side factors picked up by relative changes in education of the Māori and non-Māori populations are responsible for the observed time series pattern of disparity.

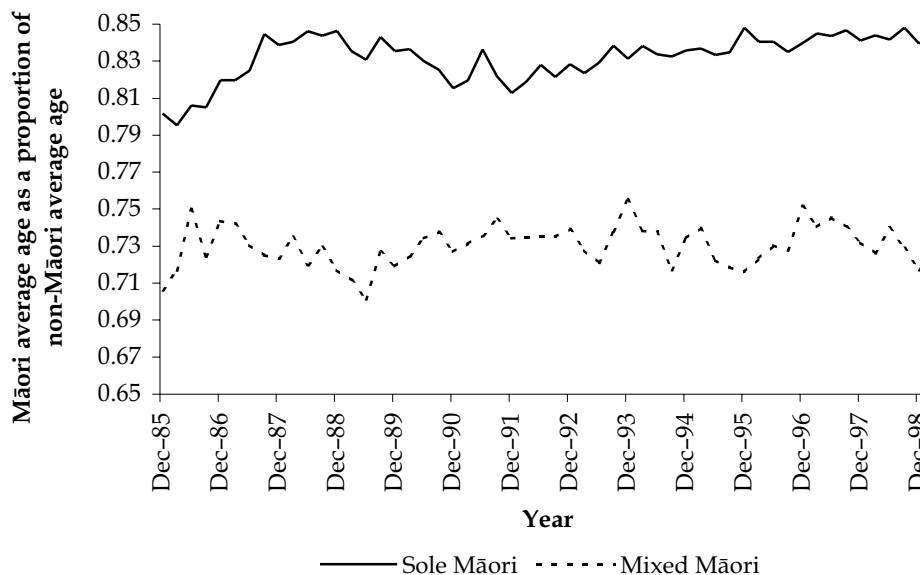
While the cross-sectional results show a strong influence of qualifications on Māori employment probabilities, Māori educational convergence towards non-Māori appears to have had little or no impact on average employment rate differences. Either the impact of educational qualifications on employment probabilities is not as strong as the cross-sectional results indicate, or there are other powerful negative factors impacting on Māori with the effect of offsetting the positive influence of educational qualification convergence over the period from 1985 to 1992 when disparity widened. The latter seems to be the more likely explanation, as will be revealed below.

Can variations in population growth and age profiles explain disparity patterns?

The other potential explanation of the time series pattern of disparity observed is that the gap between Māori and non-Māori average age has been growing over time. Age differences may be working to the relative disadvantage of Māori. However, the evidence offers no time series support for the demographic explanation. The mixed Māori group, the most youthful of the three groups, shows little trend variation in their average age compared with non-Māori. The sole Māori group, responsible for most of the time series variation in disparity, is actually slowly becoming more, rather than less, like the non-Māori group in terms of age over time. In addition, there is little about the time series pattern of sole Māori relative age that resembles the path of employment disparity.¹²

¹¹ An anonymous referee has suggested that the Duncan index is inappropriate for comparing Māori and non-Māori educational qualifications. The referee suggests that “a degree or bursary qualification should be weighted higher than a school certificate qualification” and asserts that “more Maori are gaining a qualification ... [but] at the lower [non-tertiary] end ..., hence within the indicator there is growing disparity”. It is true that the Duncan index does not tell us about the different effects of qualifications for different groups. However there is no evidence that Māori are catching up at the lower end but falling behind at the upper end. There is also evidence that Māori gain *more* from qualifications: the significant employment rate gaps are for Māori lacking in qualifications rather than those with qualifications (Chapple and Maré, 2000) and Māori have a higher increase in their employment chances with qualifications (Winkelmann and Winkelmann, 1997). Thus even if Māori were falling behind relatively at the upper end, which they do not appear to be, they may still be gaining overall compared with the Duncan disparity measure if higher qualifications get a greater weighting.

¹² The rise in sole Māori average age through the late 1980s occurs with a concomitant dip in average age for mixed Māori, suggesting again some possibility of category migration between the two populations.

FIGURE 4: Māori average age as a proportion of non-Māori average age


Closely related to the age explanation is the possibility that the observed rise in employment disparity may be because the Māori working-age population is growing at a faster rate than that of non-Māori. It may be that the economy cannot generate the sort of jobs traditionally occupied by Māori at a sufficiently rapid rate. However, there is little evidence in favour of such an explanation for Māori employment disparity. Table 2 below suggests that when employment rate disparity exploded for sole Māori, their working-age population was virtually static. On the other hand, the mixed Māori population, who experienced no abrupt upward trend in disparity, had very rapid population growth over the 1986 to 1991 period. Over the whole period the sole Māori population is the slowest growing of the three ethnic groups, growing at a very similar rate to population growth for the non-Māori group, while the mixed Māori group is easily the fastest growing of the three.

The regional picture, also presented in Table 2, shows some interesting and substantial variation in growth of working-age populations. Of particular note is the very high mixed Māori population growth in Auckland, Wellington, and the South Island. Equally, there is rapid sole Māori population growth in Northland, and a fall in the sole Māori population in the South Island over the 1986-1991 period.

It is sometimes overlooked, in the consideration of Māori/non-Māori labour market disparity, that the non-Māori group is also not ethnically homogenous. Variations in employment chances among non-Māori can provide useful insights into Māori employment disparity. In Figure 5 below, employment rate disparity is traced over time between the New Zealand European/Pākehā ethnic group and

TABLE 2: Average annual working-age population growth

	<i>Period</i>	<i>Sole Māori</i>	<i>Mixed Māori</i>	<i>Non-Māori</i>
Northland	1986-1991	3.0	19.3	0.1
	1992-1999	5.4	3.0	2.7
	1986-1999	4.4	9.8	1.6
Auckland	1986-1991	-1.1	7.6	1.7
	1992-1999	3.9	6.0	2.5
	1986-1999	1.8	6.7	2.2
Central North Island	1986-1991	2.3	0.7	0.7
	1992-1999	0.3	1.0	0.6
	1986-1999	1.1	0.9	0.6
Wellington	1986-1991	-3.2	13.7	1.6
	1992-1999	5.0	3.1	1.9
	1986-1999	1.6	7.6	1.8
South Island	1986-1991	-6.1	14.6	0.7
	1992-1999	4.8	7.5	1.2
	1986-1999	0.2	10.5	1.0
Total New Zealand	1986-1991	-0.1	5.4	1.0
	1992-1999	2.1	3.2	1.5
	1986-1999	1.1	4.1	1.3

the main three minor ethnic groups – Māori, Pacific Island and the Other ethnic group (the last being predominantly Indian and Chinese in origin). Exploiting this data variation, the study shows, unsurprisingly, a very similar pattern for Māori disparity over time compared with European/Pākehā as compared with non-Māori overall, given that the majority of non-Māori are European/Pākehā in ethnicity.

Interestingly, the pattern of Pacific Island disparity is very similar to Māori over time and in terms of levels, except through the 1985 to 1987 period. The similarity of Māori and Pacific Island time trends and levels of disparity suggests immediately that similar causal factors may be driving outcomes.

On the other hand, through the 1985-1990 period when disparity rose for sole Māori and for Pacific Islanders, the Other ethnic group had a very similar employment rate to European/Pākehā. While Māori and Pacific Island employment disparity was stable or falling, the Other ethnic group experienced a sharp rise in disparity. Currently, the Other levels of employment disparity are similar to Māori and Pacific Islanders.

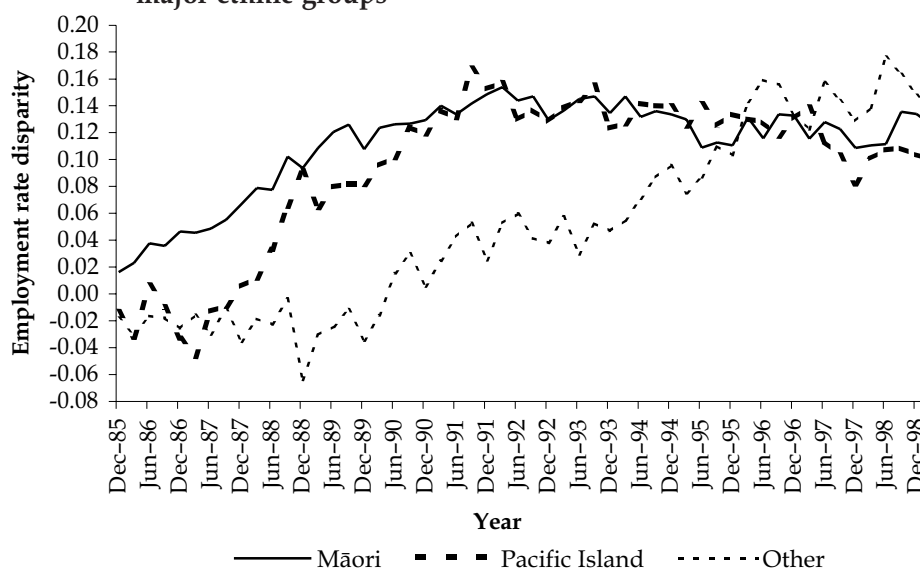
The correlation between employment disparity of the Other ethnic group and the size of their working-age population is 0.93, while the correlation between annual disparity changes and population growth rates, calculated to ensure the

levels relationship is not spurious, was 0.55.¹³ These are fairly strong correlations. The figures below reveal the strong relationship. In particular, strong rises in the Other ethnic group working-age populations, particularly through the early and mid-1990s, are reflected in surges in their employment disparity.

For the sole Māori group the correlations between population and employment disparity were lower, being 0.25 on levels, and -0.43 on the correlation between annual disparity changes and population growth rates. For mixed Māori, the corresponding correlations were 0.03 and -0.20. Weak or incorrectly signed correlations for Māori confirm earlier conclusions that population changes are not likely to be behind observed patterns of Māori employment disparity.

For the Pacific Island group, the levels correlation is 0.71 and the correlation between annual disparity changes and population growth rates is 0.16. While less strong than those for the Other ethnic group, these correlations suggest that there may be some relationship between the growth in the Pacific Island population and observed patterns of disparity. In particular, the figures below reveal that strong growth in the Pacific Island population through 1987 and 1992 is closely associated with rises in their employment disparity.

FIGURE 5: Employment rate disparity between European/Pākehā and other major ethnic groups



¹³ The addition of the "Other Pacific" category to the HLFS questionnaire means there was a drop in population of the Other group and a rise in number of the Pacific Island ethnic group between the second and third quarter of 1991. The problem was overcome by simply assuming the 1991.3 population equalled the 1991.2 population and rating the post 1991.2 population series accordingly.

FIGURE 6: As their working-age population increases, the relative position of the 'Other' ethnic group worsens

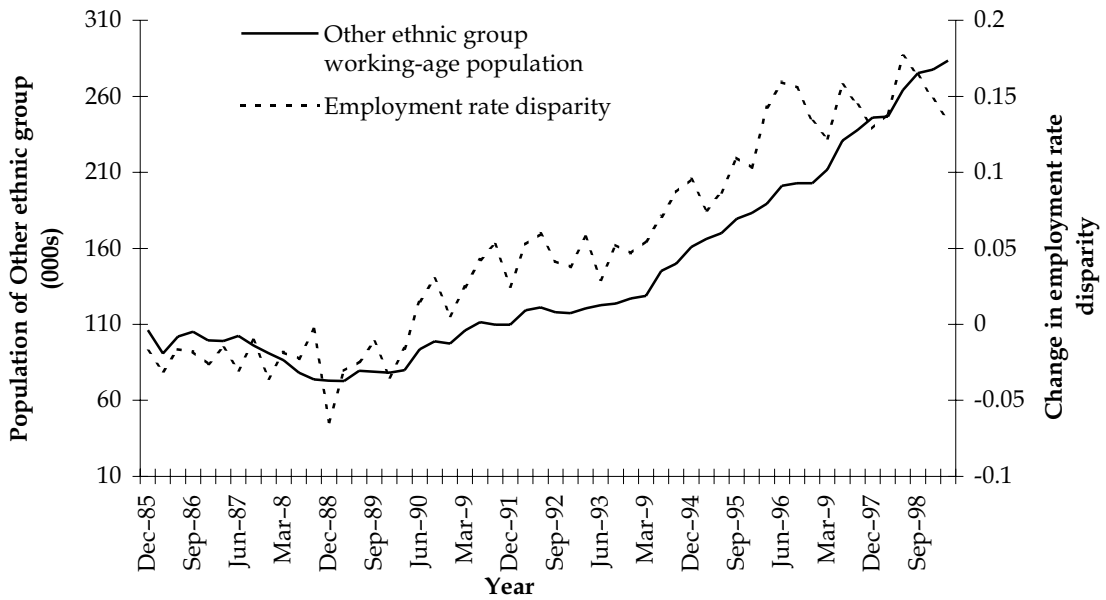


FIGURE 7: Growth in disparity and the 'Other' working-age population

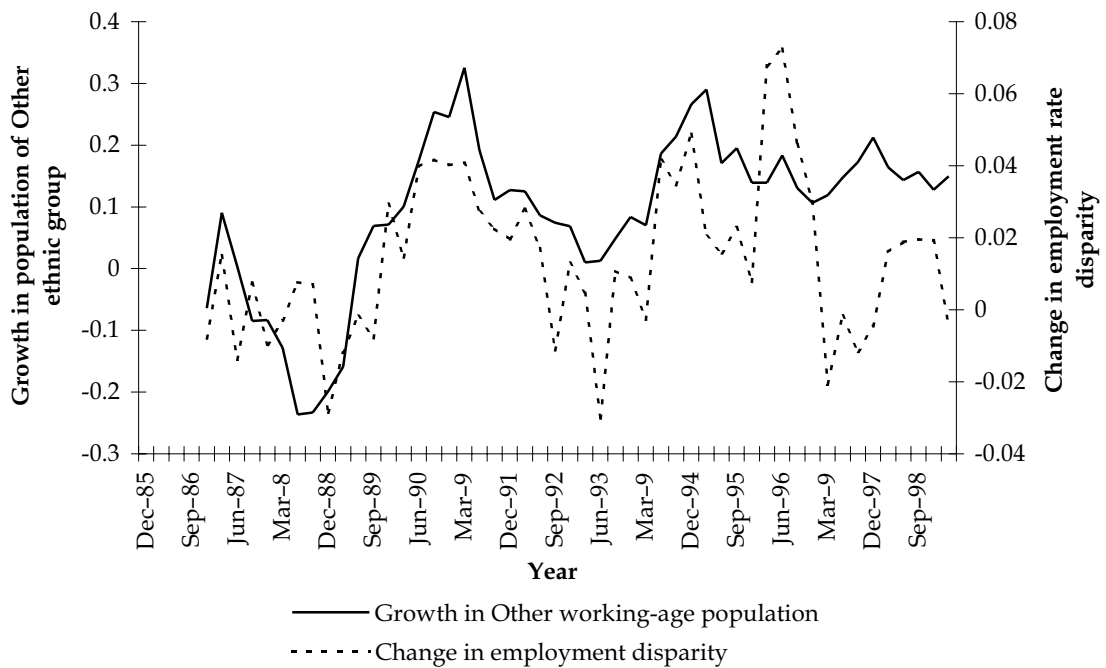


FIGURE 8: As their working-age population increases, the relative position of the Pacific Island ethnic group worsens

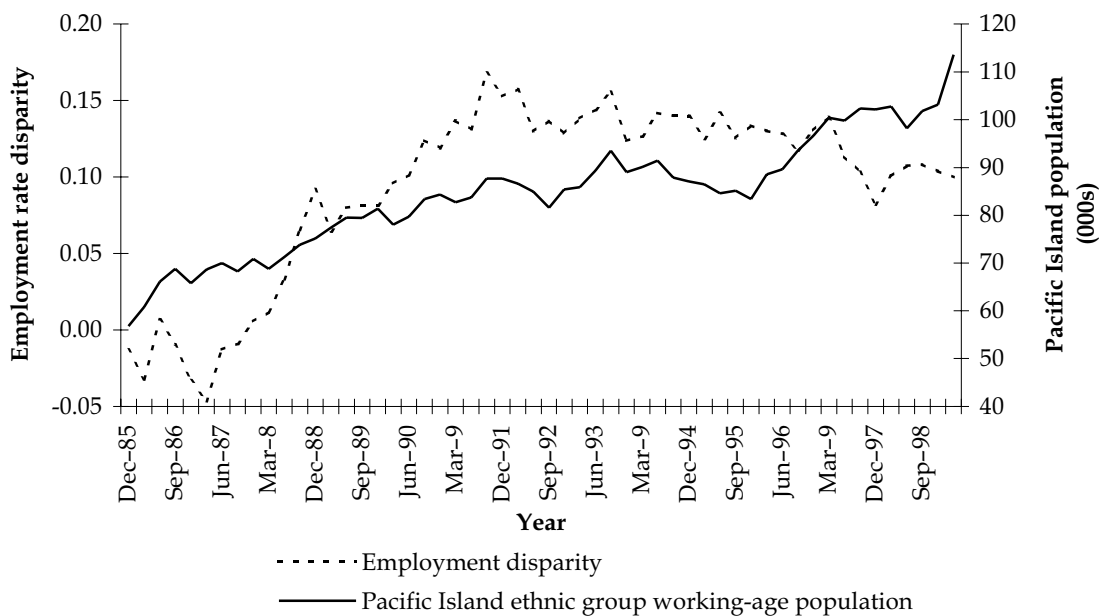


FIGURE 9: Change in employment disparity and growth in the Pacific Island working-age population



It is likely that the deteriorating relative employment prospects of the Other ethnic group and perhaps to a lesser extent the Pacific Island group has been due in part or in whole to high levels of immigration of people from those groups into New Zealand who have a lower probability of gaining employment than members of the group already domiciled in New Zealand.

However, the causal story of rapid growth in Māori working-age population causing lower relative employment chances is again not supported.

Can racial discrimination in employment decisions explain disparity patterns?

A popular demand-side explanation for the cross-sectional observation that Māori are less likely to be employed by non-Māori, is racial discrimination in hiring and firing decisions by employers. What is the evidence for or against this hypothesis?

Given that the employment rate gap between the Māori ethnic group and non-Māori ethnic group rose from 2 percent to 14 percent between 1985 and 1992 it can be reasonably concluded that at best only a small amount of the currently observed employment disparity between Māori and non-Māori is driven by discrimination.

Why? The hypothesis that discrimination against Māori has been rising between 1985 and 1992 and falling thereafter in the fashion observed is implausible. While many have mentioned the likelihood of racial discrimination operating to the socio-economic disadvantage of Māori, there are none arguing that there has been rising discrimination against Māori over the same period. Hence, discrimination can, at an absolute maximum, account for a small percentage of the current 12 percent employment gap. In reality, the maximum amount of the gap to be accounted for by discrimination will be far less, since econometric studies suggest age and education can account for a third to a half of employment disparity.

Another observation inconsistent with the discrimination hypothesis is that mixed Māori have a quite different time series profile compared with sole Māori. If changes in discriminatory behaviour were driving the time series, one should observe similar patterns in disparity over time for the mixed and sole Māori group. Equally, the time series profiles of the Other ethnic group, and to a lesser extent the Pacific Island group, who presumably would also be similarly affected by an upsurge in racism, do not show the same pattern as sole Māori and, indeed, appear to be driven to a large extent by population growth due to immigration.

The final observations inconsistent with the discrimination explanation are regional differences in employment rate gaps. Due to sample size issues, the data was only available for five regions – Northland, Auckland, the Central North Island, Wellington and the South Island. The regional patterns of disparity are different both on average and through time. The data on employment rate

disparity by region is plotted in Appendix 2 (to remove some of the noise from the data, a three-quarter centred moving average is used as a smoothing device).

In the Northland region over the period 1985–1998 sole Māori are on average a massive 20 percent less likely to be employed than non-Māori, while mixed Māori are 12 percent less likely to be employed. Māori in the Auckland labour market have a much better chance of finding work, with sole Māori 9 percent less likely and mixed Māori only 3 percent less likely to find work. The situation in the Central North Island is mid-way between that in Auckland and Northland. Sole Māori are 15 percent less likely to be in work and mixed Māori 5 percent less likely. The Wellington labour market has sole Māori 7 percent less likely to find work on average and mixed Māori 6 percent – the smallest average gap between sole and mixed Māori. Finally, in the South Island, the employment prospects of Māori are closest to those of non-Māori. Sole Māori are merely 4 percent less likely to have work while for mixed Māori the difference is even more minor – only 1 percent.

These substantial regional variations show more evidence against racial discrimination as a simple primary cause of variations in Māori/non-Māori employment prospects. Compare the average 20 percent lower chance of finding a job in Northland for a sole Māori with only 4 percent less chance in the South Island. It is hard to imagine that discrimination differs systematically across the country to an extent sufficient to explain these substantial regional variations. Indeed, some popular commentators have hypothesised that racism may be greater in the south where the population is much less ethnically mixed than in regions further north.

While it is unlikely that racial discrimination was the shock that caused the employment rate disparity to rise as it has, it is possible that discrimination has played some role in rendering Māori vulnerable to the sorts of labour market demand shocks experienced during the 1985–1992 period. It may be that racial discrimination has historically sorted Māori into certain industries and occupations, but it has no inherent tendency to make Māori more or less likely to be employed once they are working in these sectors. Quite why discrimination operates in this two-step fashion is another question. Various sector-specific labour demand shocks may then raise or reduce Māori economy-wide employment relative to non-Māori economy-wide employment, causing fluctuations in disparity. In other words, racism is not the shock that caused the pattern of disparity, but it is a factor that leaves Māori employment rates vulnerable to such a shock. While the discriminatory sorting hypothesis is plausible, it is difficult to think of ways by which it can be tested.

In addition, there are plausible stories, apart from racial discrimination, to explain why Māori are concentrated in certain industries and occupations. Māori may be concentrated in certain areas of the economy for reasons of propinquity –

they may prefer to work around other Māori. Equally, Māori may be sectorally concentrated because their low average educational levels allow them entry only into certain types of jobs. Lastly, and perhaps most importantly, many Māori migrated from country to town during the boom period of the 1950s to the 1970s. It was a period where pay differentials for skill and education were in the midst of a process of a tremendous compression. The demand for low skilled blue-collar workers was very strong. For a people with low educational skills and a rural manual background, the growth in blue-collar jobs fitted the Māori skill set readily. In addition, jobs in the freezing works and elsewhere in manufacturing paid extremely well compared with white-collar service-sector jobs. Consequently, there was little or no rational incentive for Māori to acquire higher educational qualifications or otherwise gain skills. The age old phenomena of chain migration from country to town ensured that where one Māori was employed in town, friends and relatives soon followed in response to the job information flow. When relative labour demand began to turn in favour of skilled white-collar jobs and previously favoured blue-collar jobs started to disappear, Māori found themselves sectorally concentrated in a vulnerable segment of the labour market. For some Māori, adjustment to the changed circumstances, like much labour market adjustment, may well be measured in decades or even generations.

Can structural shocks to labour demand explain employment disparity?

This section considers the industrial, occupational, regional and educational qualifications composition of the mixed and sole Māori ethnic groups in the mid-1980s. It then looks at employment growth across these dimensions between 1986 and 1998 to see whether the pattern of labour demand shifted in a manner disadvantageous to Māori.

There is evidence that Māori are concentrated in certain industries, regions and occupations and have lower education qualifications than the rest of the New Zealand population. Māori, both mixed and sole, were over-represented in declining industries like Manufacturing and under-represented in expanding industries like Finance and Business Services over the 1986-1998 period. Māori were substantially over-represented in Northland and the Central North Island, where employment was most strongly declining, and under-represented in Auckland, Wellington and the South Island where employment contractions were weaker. Māori were over-represented in blue-collar occupations, shrinking between 1986 and 1990, and under-represented in skilled white-collar occupations, which showed a quite strong employment growth.¹⁴ Māori in 1986, especially sole Māori, were over-represented amongst those with no

¹⁴ The analysis only goes up until 1990 for occupation. After 1990, there is a change in occupational coding and thus a substantial discontinuity in the occupational series.

qualifications, again a group subject to strong employment falls, and under-represented among the more educated, where employment declined by less.

Consideration of employment growth and Māori sectoral representation across all the four dimensions examined provides some support for the suggestion that a sort of structural shock to labour demand could be responsible for the observed pattern of labour market disparity. However, some important cautions are in order. The number of sectors along which structural changes can be examined is limited by sample sizes in the HLFS. Thus, while the correlations between initial Māori shares and overall sectoral employment changes are generally quite high,¹⁵ this may be primarily because of the small number of observations, rather than because of an inherently robust link. Second, distinguishing between correlation and causation is important. Even if structural shifts in labour demand were propelling the observed disparity pattern, the key sectoral dimension is not clear because Māori were over-represented in declining cells along many dimensions. Lastly, while the correlations between sectoral growth and initial sectoral shares are always lower for mixed Māori, they are generally not greatly so – except for educational qualifications – but it was only sole Māori who experienced a dramatic rise in employment rate disparity. Thus, it may be that, while mixed Māori experienced a similar shock to non-Māori, mixed Māori may have been somewhat less vulnerable but, also, their pattern of labour market adjustment may have been somewhat different.

To what extent can the Māori time series employment rate pattern, and by implication the rise in disparity for Māori, be attributed to Māori over-representation in declining industries? To what extent can the Māori employment decline be attributed to their over-representation in declining regions? To what extent can their decline be attributed to Māori over-representation amongst those with poor educational qualifications? To what extent can it be accounted for by Māori over-representation in declining occupations?

Changes in the employment rate gap can be decomposed, taking into account differential Māori representation in employment by education, industry, occupation and region, and controlling for changes in shares of the working-age population (see Appendix 1 for technical details of the formulae used). Labour market outcomes are averaged over the calendar year to remove noise. In addition, it should be noted that each of the four different ways – by education, industry, occupation and region – of cutting up the data are not additive. A high amount of the gap attributable say to region may simply be because particular industries are concentrated in certain regions and it is wholly or partially the decline of industries disproportionately occupied by Māori driving the result. In addition, the analysis can only be undertaken for occupation between 1986 and 1990: at the end of 1990 there is a significant change in occupational categories in

¹⁵ The correlations are not reported here but are available on request.

the HLFS from seven to nine. The analysis is also undertaken for mixed Māori to obtain an idea of the negative shock to mixed Māori employment as a consequence of sectoral shifts.¹⁶

Of some surprise is the extent to which coarse indicators of occupation, industry and education, controlling for changes in working-age population shares, explain quite a lot of the observed rise in employment rate disparity, especially for mixed Māori. The most powerful are education and industry, explaining two-thirds of the rise in disparity for the total Māori group and well over half the rise in disparity for the sole Māori group. Occupation also accounts for a significant amount of the rise in disparity. Region does not appear to have an important influence on employment rate disparity, especially over the 1986–1990 period.

TABLE 3: Explaining the rise in employment rate disparity (percentage points), 1986–1990

	<i>Sole Māori</i>	<i>Mixed Māori</i>	<i>Total Māori</i>
Actual rise in disparity, 1986–1990	10.9%	4.6%	8.8%
Accounted for by:			
Occupation	4.4%	4.6%	4.4%
Region	-0.1%	0.2%	-0.1%
Education	6.0%	5.1%	5.8%
Industry	5.9%	5.7%	5.8%

TABLE 4: Explaining the rise in employment rate disparity (percentage points), 1986–1998

	<i>Sole Māori</i>	<i>Mixed Māori</i>	<i>Total Māori</i>
Actual rise in disparity, 1986–1998	9.4%	2.7%	6.8%
Accounted for by:			
Occupation	n/a	n/a	n/a
Region	1.2%	2.0%	1.2%
Education	10.8%	8.5%	10.3%
Industry	3.5%	1.5%	2.4%

¹⁶ New Zealand Standard Classification of Occupations 1968: Professional, Technical and Related Workers; Administrative and Managerial Workers; Clerical and Related Workers; Sales Workers; Service Workers; Agricultural, Forestry and Fishery Workers; Production and Related Workers, Transport Equipment Operators and Labourers. New Zealand Standard Classification of Occupations 1990: Legislators, Administrators and Managers; Professionals, Technicians and Associate Professionals; Clerks; Service and Sales Workers, Agriculture and Fishery Workers; Trades Workers; Plant and Machine Operators and Assemblers; Elementary Occupations.

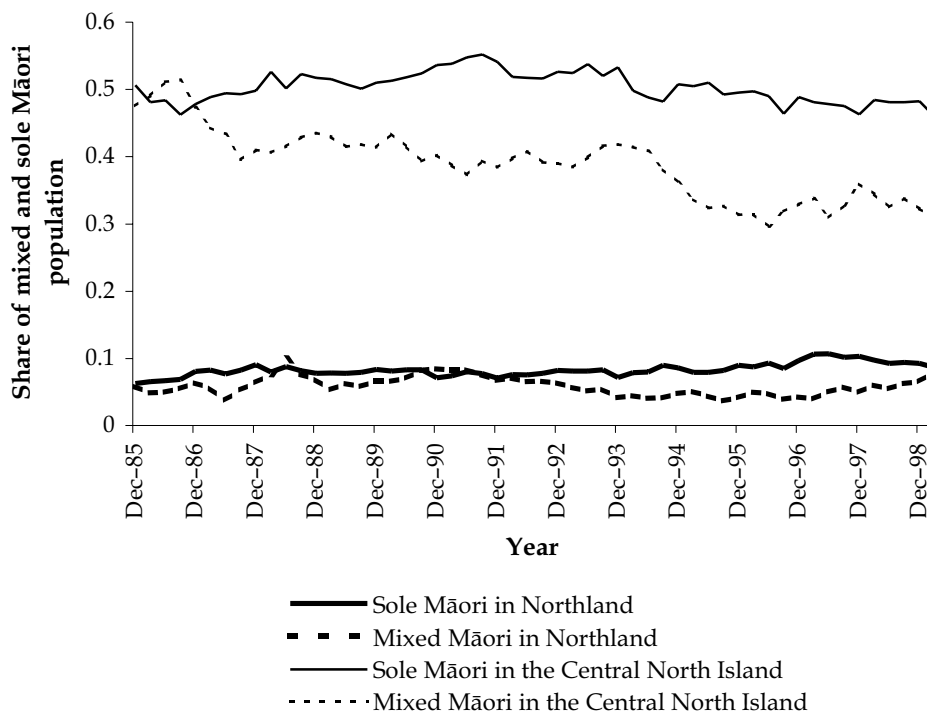
The analysis provides support for the contention of Winkelmann and Winkelmann (1998) that much of the decline in the Māori share of employment can be accounted for by a shock, or series of negative shocks, to unskilled labour demand. The question of different adjustment to shocks by mixed and sole Māori is examined below.

Speed of labour market adjustment for mixed and sole Māori

Why might mixed Māori adjust more rapidly to a given labour market shock than sole Māori? The fact that mixed Māori are on average better educated, younger, and have higher incomes may allow them to adapt more rapidly to a similar shock than sole Māori. The stronger average socio-demographic profile of mixed Māori may give them more resilience. In addition, mixed Māori may have less attachment to certain regions for cultural or economic reasons than sole Māori and thus may be more geographically mobile into job rich areas.

In terms of regional mobility, it is worth observing that the two regions that have experienced the largest falls in employment rates over the 1986–1998 period are Northland and the Central North Island (see Figure 10). While no more than suggestive, there is evidence that mixed Māori are more likely to abandon the

FIGURE 10: Population shares of Māori working age populations in Northland and the Central North Island



growing job deserts than sole Māori. The data suggest that the mixed Māori working-age population is relatively shrinking in the Central North Island at a faster rate than sole Māori (see Figure 10). The negative time correlation for mixed Māori (-0.88) is also much stronger than for sole Māori (-0.30). In addition, the relative sole Māori population locating in job-poor Northland is growing over time (correlation with time is +0.69) while there is weak evidence that the mixed Māori share in Northland is falling (time correlation -0.30). The evidence suggests that the mixed Māori working-age population may be moving out of declining regional labour markets with greater ease than sole Māori. The relative distribution of the mixed Māori population has become more like non-Māori over the period, whereas the population distribution of sole Māori has become rather less like the non-Māori population. Mixed Māori may be more geographically mobile than sole Māori in search of work.

Conclusion

This paper has examined various theories that might explain the pattern of employment rate disparity for Māori. Supply-side variations in age disparities, high growth in the Māori working-age population, variations in educational qualification disparities and demand-side variations in racial discrimination receive little support as primary causes of current Māori employment rate disparity. The variations along explored regional, industrial, ethnic and time series dimensions provide evidence against all of these hypotheses.

On the other hand, there is support for the view that Māori were located in jobs that received a negative labour demand shock as a consequence of technological changes in the pattern of labour demand, or because of the liberalisation and stabilisation of the New Zealand economy over the 1985–1992 period. The conclusion drawn here is not novel: it was tentatively hypothesised by Winkelmann and Winkelmann (1997) and even earlier the much sharper fall in Māori employment over 1986–1989 was pointed out by the New Zealand Planning Council (Economic Monitoring Group, 1989). There is some evidence that this demand shock was proportionately less severe for mixed Māori compared with sole Māori in the sense that they were somewhat less over-represented in the vulnerable sectors. Furthermore, given their younger age, higher education levels, higher levels of income (and probably tangible assets), stronger representation in job-richer main urban areas, and ability to link in non-Māori employment networks, mixed Māori were probably better equipped to adjust to the relative demand shock than sole Māori.

Some of the reduction in employment disparity post-1990 can be put down to sluggish Māori labour market adjustment back to equilibrium following the impact of the negative demand shock of 1985–1990. Some of the reduction in disparity can also be put down to the slow convergence of Māori educational endowments (and, in the case of sole Māori age, as well) to those of non-Māori, a

positive effect that was overwhelmed in the late 1980s by the strength of the negative demand shock. Lastly, a compositional shift in the Māori ethnic group towards a higher share of mixed Māori, who have considerably better labour market outcomes than sole Māori, has reduced labour market disparity at the level of the ethnic group. Without undertaking a detailed multi-variate decomposition study, there is little more one can say regarding the relative importance of these factors.

Māori labour market disadvantage is not widely and evenly dispersed across the Māori ethnic group. Labour market disadvantage is highly concentrated amongst those of the Māori ethnic group who identify only as Māori, those who traditionally work in blue-collar occupations and in primary and secondary industries, those who live north of Wellington, and those who have no educational qualifications. In terms of designing employment intervention policy these points need to be borne in mind.

Employment disparity for mixed Māori as a whole and for sole Māori who live in Wellington and the South Island is much lower and displays no obvious trend between 1985 and 1999. Mixed Māori perform better than sole Māori in all regions, with the possible exception of Northland. In all regions, except Northland, mixed Māori outcomes are on average closer to non-Māori than to Māori. The worst performing regional labour market for Māori by a considerable amount is, again, Northland. It is also the area of highest Māori population growth and an area where Māori are disproportionately over-represented. An open question is the extent to which the very poor performance of the Northland labour market is driven by a better but still poorly performing Auckland labour market for sole Māori. Finally, there is evidence that Māori perform worse relative to non-Māori in regions where Māori make up a higher local population share. Māori perform best relative to non-Māori in areas where the Māori population share is relatively low, like the South Island.

This study has focused attention on the significant average differences in employment chances between non-Māori and mixed and sole Māori. It ends, however, with the important reminder that being Māori is an extremely poor marker of employment and earnings disadvantage. The overwhelming amount of variation in individual employment chances is not explained directly or indirectly by membership of the Māori ethnic group. Recalling the discussion in the introduction, massive intra-ethnic group variation in employment chances strongly suggests researchers and policy-makers need to bear in mind that Māori ethnicity does not consign people to failure.

In terms of future research, this note recommends that greater attention be paid to the variance of outcomes within Māori and non-Māori ethnic groups and the implications this has for analysing and addressing disparity. In addition, there is a need for multi-variate approaches to consideration of the evolution

of gaps between ethnic groups. An interesting project would be to estimate equations explaining employment chances for three cross-sections – the mid-1980s, the early 1990s and now – and examine the evolution of the various coefficients for different ethnic groups, as well as the variance explained by ethnicity. More focus, too, needs to be placed on sub-cultures where socio-economic failure or success is observed rather than on failure or success at the level of coarse ethnic groups. Finally, over the last two decades there has been a growing number of Māori initiatives to deliver services, including employment services, to Māori. There are likely to be more of these initiatives and their rationale is that they can deliver more effective outcomes to Māori. The hypothesis, that an important solution to disparity is Māori delivery of programmes, needs to be examined with high-quality, independent programme evaluations.

References

- Bacica, L (1984) 'Components of unemployment', *New Zealand Population Review* 10 (3), pp 69–75.
- Callister, Paul (1998) 'The "Meet" Market: Education and Assortative Mating in New Zealand', *New Zealand Population Review* 24 (1&2), pp 43–70.
- Chapple, Simon, Richard Jefferies and Rita Walker (1997) 'Māori Education Participation and Performance: A Literature Review and Research Programme', paper for the Ministry of Education, April 1997.
- Chapple, Simon and Rea, David (1998) 'Time Series Analysis of Disparity between Māori and non-Māori Labour Market Outcomes', *Labour Market Bulletin* 1&2, pp 27–144.
- Chapple, Simon and Maré, Dave (2000) 'Literacy formation and its influence on earnings and jobs', unpublished Department of Labour draft.
- Coope, Pat and Piesse, Andrea (undated) '1991–1996 Inter-censal consistency study', Department of Statistics, Analytical Support and Survey Methods Sections.
- Duncan, OD and Duncan, B (1955) 'A Methodological Analysis of Segregation Indexes', *American Sociological Review* 20, pp 210–217.
- Easton, Brian (1994) 'Māori in the Labour Force', report for Te Puni Kōkiri, 30 July.
- Economic Monitoring Group (1989) *The Economy in Transition: Restructuring to 1989*, Wellington, New Zealand Planning Council.
- Maloney, Tim (1995) 'Ethnic differences and unemployment rates over the history of the Household Labour Force Survey', report to the New Zealand Treasury, 22 May.
- Maynard, Kristen; Coebergh, Branko; Anstiss, Brendan; Bakker, Leon; Huriwai, Terry (1999) 'Ki Te Arotu: Toward a New Assessment: The Identification of Cultural Factors which may Predispose Maori to Crime', *Social Policy Journal* 13 (December), pp 43–54.
- New Zealand Health Survey 1997, Statistics New Zealand.
- Te Puni Kōkiri (1998) *Progress Toward Closing Social and Economic Gaps Between Māori and non-Māori*, Te Puni Kōkiri, Wellington.
- Winkelmann, Liliana and Winkelmann, Rainer (1997) 'Determining the Relative Labour Force Status of Māori and Non-Māori Using a Multinomial Logit Model', *Labour Market Bulletin* 1, pp 24–5.

Appendix 1: Formulae for decomposing the employment rate gap

Let j = group (in this case ethnic group), i = sector (education, occupation, region, industry etc), t = time.

Let E be employment, W be working-age population and ER be the employment rate. Then:

$$\Delta ER_{jt} \equiv \frac{E_{jt}}{W_{jt}} - \frac{E_{jt-1}}{W_{jt-1}}$$

Let predicted employment on the basis of sector of the j th group be:

$$\bar{E}_{jt} = \sum_i E_{jit-1} \times \left(1 + \frac{\Delta E_{it}}{E_{it-1}} \right)$$

This assumes that employment for the j th group grows at the overall rate of the sector.

At the same time let predicted working-age population growth of the j th group be:

$$\bar{W}_{jt} = W_{jt-1} \times \left(1 + \frac{\Delta W_{jt}}{W_{jt-1}} \right)$$

Thus, the predicted change in the employment rate of the j th group had their employment grown at average industry rates and had their working-age population grown at the aggregate rate, is:

$$\overline{\Delta ER}_{jt} = \frac{\bar{E}_{jt}}{\bar{W}_{jt}} - \frac{E_{jt-1}}{W_{jt-1}}$$

Thus, the predicted changes in the overall gap can be constructed for the two j groups. If the actual gap grew by 10 percentage points the predicted gap could also be generated.

The actual change in Māori/Non-Māori disparity and the predicted change in disparity on the basis of sectoral growth patterns, controlling for differential working age population growth, is:

$$\frac{\Delta \text{disparity}}{\Delta \text{disparity}} = \frac{(ER_{mt} - ER_{nmt}) - (ER_{mt-1} - ER_{nmt-1})}{\Delta \bar{ER}_{mt} - \Delta \bar{ER}_{nmt}} \equiv (ER_{mt} - ER_{mt-1}) - (ER_{nmt} - ER_{nmt-1})$$

Thus, the predicted change in disparity considers the impact of differential initial sectoral employment distribution and sectoral employment growth on changes in disparity, holding each population group's initial share of the working-age population constant.

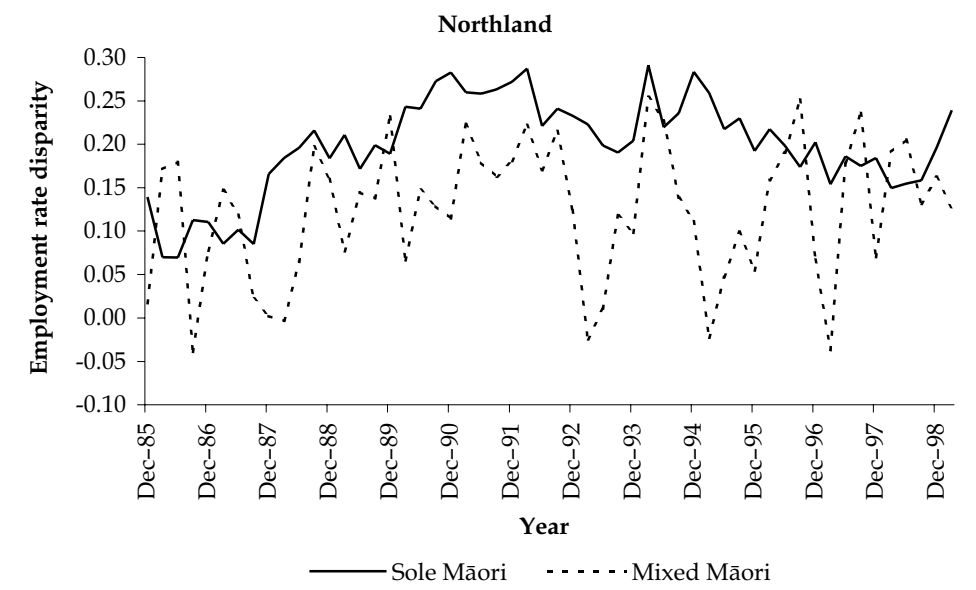
Appendix 2: Regional disparities in employment rates

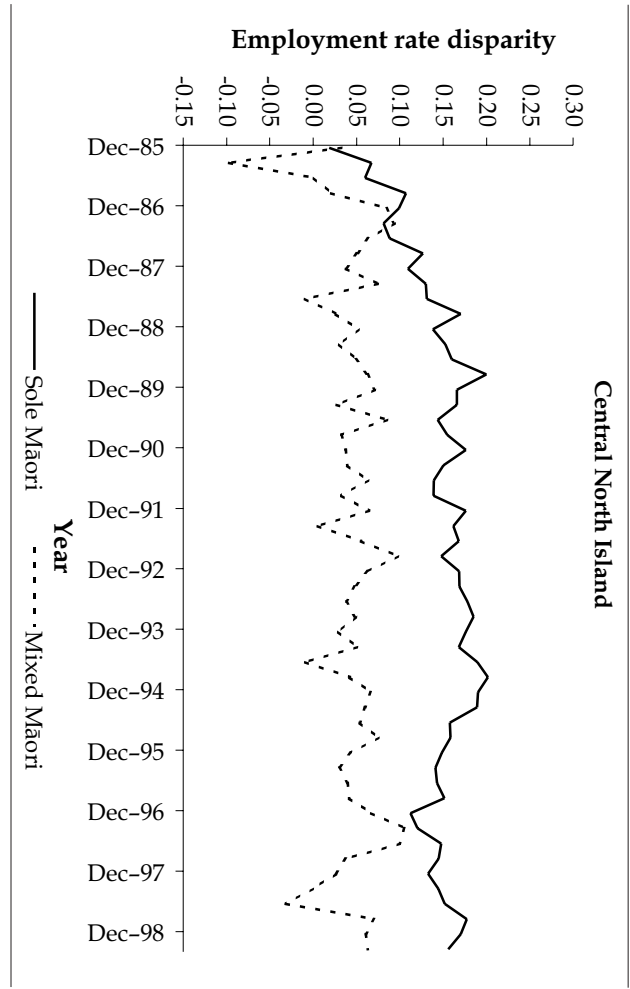
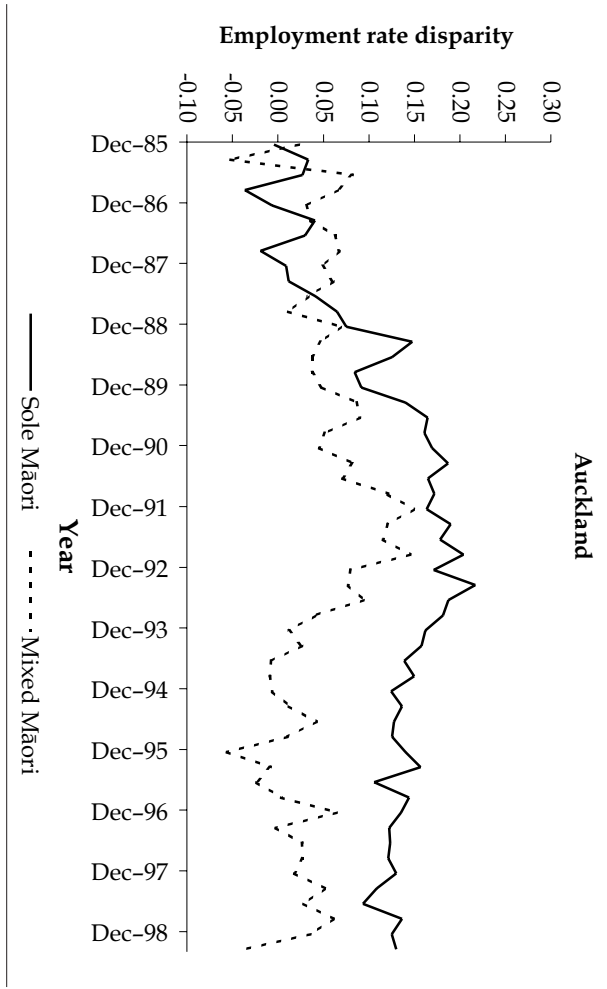
Employment rate disparities by the five regions for mixed and sole Māori are plotted below. Similar time series patterns are observed in Northland (averaging 8.3 percent of the sole and 5.9 percent of the mixed Māori working-age population), Auckland (24.0 percent of the sole Māori population, 25.7 percent of the mixed) and the Central North Island regions (50.3 percent of the sole Māori population, 38.9 percent of the mixed). The three northern regions have a pattern of rising sole Māori disparity up until the early 1990s, falling disparity thereafter and a failure of disparity to return to lower levels experienced in the mid 1980s. However, the size of the 1985–1992 deterioration was far greater in Northland than in Auckland and, to a lesser extent, also greater than in the Central North Island.

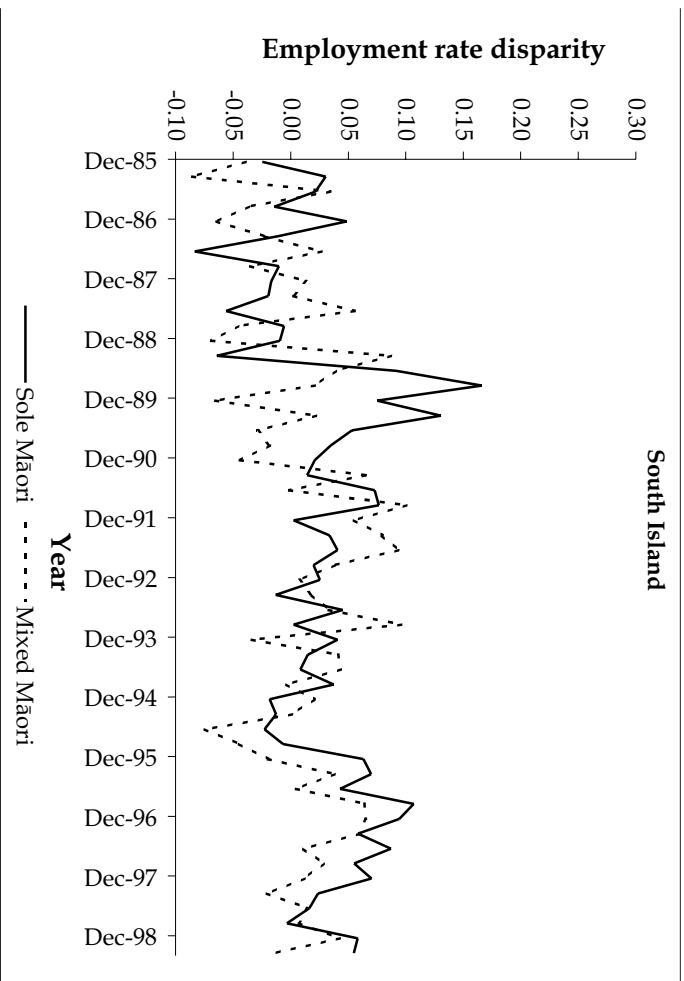
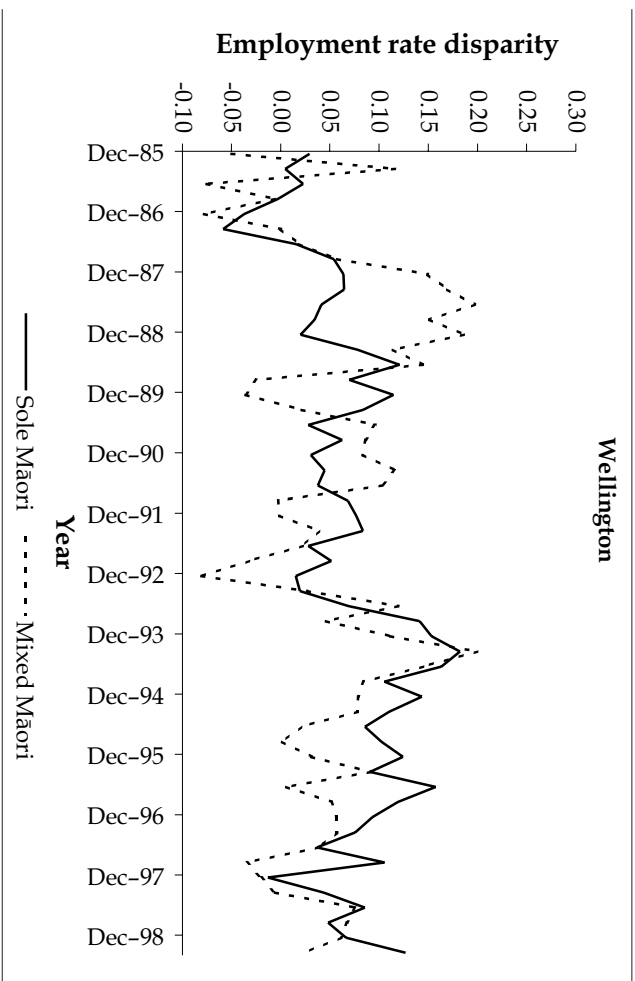
Disparity is much lower and has little or no obvious cyclical pattern or time trend further south in Wellington (9.1 percent of the sole Māori population, 12.2 percent of the mixed) and the South Island (8.3 percent of the sole Māori population, 17.4 percent of the mixed). In addition, systematic differences between sole and mixed Māori in the two southern regions are much less obvious than in Auckland, the Central North Island and, to a lesser extent, Northland.

The highest Māori working-age population growth has been in Northland, where their relative and absolute job prospects are the poorest. In Auckland, where relative Māori job prospects are better, sole Māori have grown at a slower rate than have non-Māori and mixed Māori. Population growth has been weakest in the Central region, with sole Māori growing at 1.1 percent, mixed Māori at 0.9 percent and non-Māori at 0.6 percent. In both Wellington and the South Island

FIGURE A1: Employment rate disparity by region







relative sole Māori job prospects are the best. The sole Māori population is growing at 1.6 and 0.2 percent respectively in these regions. Mixed Māori growth is exceedingly high at 7.6 and 10.5 percent respectively and non-Māori are growing at 1.8 and 1.0 percent. The extraordinary growth in the mixed Māori population in the South Island is likely to be partly attributable to inter-ethnic category migration, perhaps partly encouraged by the Ngai Tahu treaty claims process.

Taking the employment rates of mixed Māori, sole Māori and non-Māori across regions, the regional spread of employment rate outcomes is by far the largest for sole Māori. The gap in average employment rates between the average best and worst performing of the five regions for sole Māori is a massive 19 percentage points. The same gap is 14 percentage points for mixed Māori and only 6 percentage points for non-Māori. There is much more regional concentration of disadvantage for the sole Māori population.

What is more, Māori are relatively worse off in areas where their populations are concentrated (see Table A1 below). The correlation between average sole and mixed population share and average disadvantage is high ($r=0.93$, $n=10$).

TABLE A1: Māori disadvantage is concentrated in regions with high Māori population shares

	<i>Region</i>	<i>Average employment rate gap 1985–1999 (%)</i>	<i>Average share of sole/mixed working age population in the region (%)</i>
Sole Māori	Northland	19.8	16.7
	Auckland	11.6	6.8
	Central North Island	14.6	11.3
	Wellington	6.8	4.8
	South Island	2.8	2.1
Mixed Māori	Northland	12.4	4.6
	Auckland	4.3	2.6
	Central North Island	4.4	3.3
	Wellington	5.3	2.6
	South Island	1.1	1.7