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LABOUR MARKET OUTCOMES FOR IMMIGRANTS AND THE NEW ZEALAND-BORN 1997–2009

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CONTENTS

GLOSSARY

Human capital: The stock of knowledge and skills, embodied in an individual as a result of education, training, and experience that makes the individual more productive in the labour market. The concept of human capital generally includes both measurable variables such as years of schooling and years of labour-market experience, as well as typically unmeasurable variables such as motivation and social skills.

Returns to human capital: The average additional return – usually measured in wages – due to a unit increase in any dimension of human capital. For example, returns to schooling refer to the average increase in wages in a population of individuals due to an additional year of schooling.

Observed human capital: Observed human capital refers to a subset of measurable human capital for which a researcher has data.

Unobserved human capital: Unobserved human capital refers to both measurable human capital for which the researcher does not have data and unmeasurable human capital.

Potential labour-market experience: An individual's age minus their years of schooling minus the age at which individuals typically start school in the country. This measure is typically used as a proxy for actual labour-market experience when this information is unavailable. It assumes that workers participate continuously in the labour force once they complete their formal schooling.

Predicted labour market outcomes: In the context of this paper, the outcomes that a particular group of individuals would be expected to have if they were assigned the characteristics of another group of individuals, holding everything else constant. For example, based on regression modelling, we can predict what the employment rate for New Zealand–born men would be if they had the same characteristics as immigrant men, but everything else, including the relationship between all characteristics and employment rates, remained the same. Comparing the difference in employment rates predicted using this method for any two groups to the difference in actual employment rates for these group shows what proportion of the actual difference occurs because of differences in characteristics between the two groups. Sometimes differences will remain unexplained by the available data on characteristics.

Immigrants: In the context of this paper**,** immigrants are overseas-born individuals who have been residing in New Zealand for at least 5 years.

EXECUTIVE SUMMARY

Context of this paper

In this paper, unit record survey data from the 1997–2009 New Zealand Income Survey (NZIS) is used to examine:

- how labour market outcomes and returns to human capital vary in the immigrant and non–immigration populations in New Zealand
- whether these returns vary over time and across business cycles.

First, regression analysis is used to estimate the relationship between education and employment, hours worked, and wages for immigrants and the New Zealand–born separately for men and women, controlling for other factors that are related to individual wages. These relationships are allowed to vary over time to see whether any variation is systematically related to business cycles or other macroeconomic variation.

Second, the same approach is then used to examine the relationship between education and labour market outcomes for immigrants and New Zealand–born with different ethnic backgrounds and from different source countries, again separately for men and women. This part of the analysis extends previous work by Stillman and Velamuri (2010) to simultaneously consider the relationship between immigrant status and ethnicity, and labour market outcomes.

This extends the analysis undertaken in Stillman and Velamuri (2010) and previous work by Dixon (2000), Maani (2004), Hyslop and Maré (2009) and Stillman and Maré (2009) among others by examining how labour market outcomes vary by gender, ethnicity, and immigration status in the same empirical framework and by extending the analysis to 2009.

Descriptive findings

Education – substantial increase across all four groups

Between 1997 and 2009, mean years of education substantially increased for all four groups (New Zealand–born men, New Zealand–born women, immigrant men, and immigrant women).

Immigrant men have, on average, 3 to 6 months more education then New Zealand–born men, while immigrant women have, on average, the same amount of education as New Zealand–born women.

Employment – on average overseas-born individuals have slightly lower employment rates

Immigrants are generally less likely to be employed. On average between 1997 and 2009, employment rates for immigrant men were 2 to 3 percentage points less than for New Zealand–born men. For example, the employment rate for immigrant men in 1997 was 83 percent and for New Zealand–born men was 87 percent. In 2009, the rates were 85 percent and 88 percent, respectively.

The gap in the employment rate between immigrant women and New Zealand–born women widened during the survey period. While employment rates for immigrant women increased from 66 percent in 1997 to 71 percent in 2009, those for New Zealand–born women increased strongly from 68 percent in 1997 to 76 percent in 2009.

Similar differences in employment rates are observed across the entire educational distribution.

Hours worked – immigrant men work fewer hours; immigrant women work more hours

Employed immigrant men work, on average, 3 to 6 percent fewer hours than employed New Zealand–born men. Hours worked has declined over time for both the New Zealand–born and immigrant men.

Employed immigrant women, however, work more hours (33–36 hours a week) than employed New Zealand–born women (32–33 hours a week).

These observed differences in hours worked occur mostly among less-educated workers. In fact, immigrants with university education and above generally have quite similar hours worked as the New Zealand–born with the same level of education.

Real wages – similar between groups of the same gender

Real wages, on average, are generally similar for immigrants and the New Zealand–born of the same gender.

Examining how this varies by education reveals that less-educated immigrant men generally have lower wages than similarly educated New Zealand–born men, while the reverse is true for immigrant men with more than 14 years of education. Similar results are found for immigrant women, but the tipping point is 11 years of education.

Differences over time – surprising lack of variation in differences

Overall, there is a surprising lack of variation in difference in employment rates, hours worked, and real wages for New Zealand–born and immigrants between 1997 and 2009. This suggests that, at least over this period, the business cycle did not have differential impacts on labour market outcomes for immigrants and the New Zealand–born.

Findings after controlling for differences in individual characteristics

After controlling for differences across individuals in education attainment, work experience, martial status, household type, geographic region, and years in New Zealand and arrival year for immigrants, the main results are as follows.

Education – immigrants earn relatively more for additional education

The relationship between education and both employment and hours worked conditional on employment is the same for immigrants and New Zealand–born of the same gender.

On the other hand, immigrants earn relatively more in terms of hourly wages than the New Zealand–born for each additional year of education.

Employment – lower immigrant employment rates not explained by different characteristics

Differences in characteristics do not explain the observed lower employment rates for both male and female migrants at all points in the educational distribution.

This suggests that factors, such as poor job networks, discrimination and higher reservation wages, lead to lower employer rates among all immigrants.

Hours worked – different work hours of less-educated migrants not explained by different characteristics

Differences in characteristics also do not explain the shorter average work hours of less-educated male migrants and the longer average work hours of less-educated female migrants.

These differing patterns of hours worked among immigrants could be the subject of a more in-depth analysis.

Wages – average wage for immigrants lower

Once we account for the fact that immigrants are more highly educated than the New Zealand–born along with other differences in characteristics, the average wage for immigrants is 4 percent to 8 percent lower than the average wage for equivalent New Zealand–born workers.

This gap in wages, controlling for characteristics, is largest among less-educated workers. For example, among individuals with 12 years of education, the predicted wage gap is 9 percent for immigrant men and 5 percent for immigrant women, while for individuals with 15 years of education the immigrant wage gap is 4 percent and 2 percent, respectively.

As with differences in employment rates, this may occur because immigrants, particularly those with less education, have worse job networks, or lower effective human capital (perhaps because of poor language skills), or experience labour market discrimination.

Further findings

Further examining how labour market outcomes vary for immigrants and New Zealand–born with different ethnic backgrounds and from different source countries reveals the following.

Employment Gaps

Differences in characteristics, such as education, explain most of the large employment gap, particularly for men, between New Zealand–born Māori, New Zealand–born Pasifika and New Zealand–born Pākehā/Europeans.

However, Foreign-born Pacific, Asian-born Asians, Pacific-born Asians, and Foreign-born Other still have lower employer rates then New Zealand–born Pākehā/Europeans after accounting for differences in characteristics.

Little employment gap exists in the first place for New Zealand–born Asians, Australian-born European, United Kingdom (UK)-born European and Other-born European compared with New Zealand–born Pākehā/Europeans.

Wage Gaps

Unlike for employment rates, New Zealand–born Māori and New Zealand–born Pasifika have lower wages relative to New Zealand–born Pākehā/Europeans even after accounting for differences in characteristics.

Similarly, once the different average characteristics of each group are controlled for, large wage gaps are found for New Zealand–born Asians, Foreign-born Pasifika, Asian-born Asians, Pacific-born Asians, Other-born Asians and Foreign-born Other. In the case of New Zealand–born Asians, this is true even though wages are higher, on average, than for New Zealand–born Pākehā/Europeans before controlling for differences in characteristics between the two groups.

Wages for Australian-born Europeans, UK-born Europeans and Other-born Europeans are similar or higher than those for New Zealand–born Pākehā/Europeans even after accounting for differences in characteristics.

Summary

Overall, these results indicate that in regards to employment rates, it is immigrant status rather than ethnicity that is driving poor outcomes for Asians and Pasifika in New Zealand.

When interpreted with the evidence from the first analysis that immigrants at all levels of education have lower employment rates than equivalent New Zealand–born, these results are consistent with Asian and Pasifika immigrants having worse job networks or higher reservation wages, perhaps because of different family obligations, less access to informal childcare, or being impacted by labour market discrimination.

It is also possible that lower employment rates occur because these immigrants have lower effective human capital than equally educated New Zealand–born, perhaps because of poor English language skills. However, in this case one might expect to find larger employment differences among less-educated migrants since this is presumably the group for whom poor language skills are most common.

On the other hand, in regards to wages, Māori, Pasifika, and Asians are found to have much lower wages than individuals with European or Other ethnicity regardless to whether they are immigrants.

When interpreted along with the evidence from the first analysis that it is only less-educated migrants who have much lower wages than equivalent New Zealand–born, these results suggest that labour market discrimination may play an important role in wage setting among less-educated Māori, Pasifika, and Asians in New Zealand. However, other possible explanations, such as lower quality education, worse job networks, or occupational segregation could also explain these findings.

Further research

Further research using different data is needed to distinguish, in an empirical sense, the relative importance of each of these possible explanations for worse labour market outcomes among individuals in different ethnic/immigrant groups in New Zealand. For example, detailed data on individual job search behaviour could be used to examine whether equivalent New Zealand–born Pākehā/Europeans, members of minority ethnic groups, and immigrants have similar job-finding rates. Similarly, longitudinal employee–employer data could be used to see whether promotion, wage progression, and retention rates differ by ethnicity and immigrant status for otherwise similar employees or whether certain groups of workers appear to be paid less than what they contribute to firm productivity (for example, Hellerstein et al 2002).

1 INTRODUCTION

In this paper, unit record survey data from the 1997 to 2009 New Zealand Income Survey (NZIS) is used to examine how labour market outcomes and returns to human capital vary in the immigrant and non–immigration populations in New Zealand and whether these returns vary over time and across business cycles. This extends the analysis undertaken by Stillman and Velamuri (2010) and previous work by Dixon (2000), Maani (2004), Hyslop and Maré (2009), and Stillman and Maré (2009) among others by examining how labour market outcomes vary by gender, ethnicity, and immigration status in the same empirical framework and by extending the analysis to 2009.

The analysis in the paper can be separated into two parts.

First, regression analysis is used to estimate the relationship between education and employment, hours worked, and wages for immigrants and the New Zealand–born separately for men and women, controlling for other factors that are related to individual wages. These relationships are allowed to vary over time to see whether any variation is systematically related to business cycles or other macroeconomic variation.

Second, the same approach is used to examine the relationship between education and labour market outcomes for immigrants and New Zealand–born with different ethnic backgrounds and from different source countries, again separately for men and women. This part of the analysis extends previous work to simultaneously consider the relationship between immigrant status and ethnicity, and labour market outcomes.

2 LITERATURE REVIEW

Hyslop and Maré (2009) used data from the 1986, 1991, 1996, and 2001 Census to examine changes in educational attainment among all New Zealand residents during this period and how this related to changes in the returns to education. They find that educational attainment increased markedly between 1986 and 2001, while the income premiums for higher qualifications first increased and then stabilised or decreased over the 1990s. A few other papers have examined how returns to education in New Zealand vary by gender, ethnicity, and immigration status during similar periods.

For example, Dixon (2000) used data from the Household Economic Survey (HES) and NZIS to examine changes in the gender earnings gap in New Zealand between 1984 and 1998 and how this related to returns to human capital. This paper found that returns to education were significantly higher for men than for women throughout this period, although only at the upper–end of the qualification distribution (that is, the returns to university degrees and above). Maani (2004) used data from the 1986 and 1996 Census to examine changes in income levels for Māori relative to Pākehā/Europeans over this period and how this related to differences in returns to education. This paper found that returns to education for Māori men were lower than those for Pākehā men in 1986, but significantly higher across the entire qualification distribution in 1996, while returns to education for Māori women were substantially higher than those for Pākehā women in both periods.

Stillman and Maré (2009) used data from the 1997–2007 NZIS to examine the economic performance of immigrants in New Zealand. While the focus in this paper was not on estimating returns to education, the authors did examine whether differences in returns for immigrants compared with the New Zealand–born explained any of the observed differences in labour market outcomes. They found that returns to education were generally quite similar for immigrants and the New Zealand–born, although there was some evidence of lower returns for immigrants at the top of educational distribution. In contrast, Stillman and Velamuri (2010) used data from the 2008–2009 NZIS to examine whether returns to education differed for immigrants and the New Zealand–born, and found that immigrants had significantly higher returns to education.

3 DATA

3.1 New Zealand Income Survey

This paper uses unit record data from the 1997–2009 NZIS. Since 1997, it has been carried out by Statistics New Zealand each June quarter as a supplement to the Household Labour Force Survey (HLFS), which surveys approximately 15,000 households and 28,000 adults each quarter using an eight-quarter rotating panel set-up.[1] Taken together, the two surveys collect data on household structure, the socio-demographic characteristics of household members, and labour force activity in the reference week and recent incomes for individuals at least 15 years old.

The HLFS collects information on how many years each individual has lived in New Zealand and their country of birth. Before 2008, country of birth was coded to a classification that could be aggregated up to four meaningful groups: Australia, United Kingdom, Pacific Islands, and Asia, and a residual category for all other foreign–born individuals.

The HLFS also collects data on ethnicity, with individuals able to report up to three from the selection of Pākehā/European, Māori, Pacific Islander, Asian, and Other. In the first part of our analysis, we compare outcomes for immigrants to those of the New Zealand–born. In the second part, we then combine the information on country of birth and ethnicity to make detailed comparisons of differences in returns to education for individuals from different backgrounds.

Our analysis sample is restricted to individuals aged 25–59 with non–missing information on country of birth who have been residing in New Zealand for at least 5 years. This is done to maintain comparability with Stillman and Velamuri (2010) and to focus on immigrants that have had time to adjust to their new labour market. We drop a limited number of observations that have missing information on qualifications or marital status.

Pooling the 13 years of data, we end up with a sample of 80,044 New Zealand-born men, 16,366 foreign-born men, 90,779 New Zealand-born women and 18,541 foreign-born women. Seventeen percent of both the male and female samples are foreign–born.

3.2 Measuring human capital

One important task for our analysis is defining human capital. The NZIS collects data on qualifications earned at both the school and post-school level. We use this information to estimate the number of total years spent by each individual in school and post-school education.[2] We then calculate the number of years of potential labour market experience for each individual as their age minus their

[1] Only 85 percent of these respondents to the HLFS also complete the NZIS. Responses are imputed for the remaining individuals. We discuss below how we treat this data. Sampling weights are calculated by Statistics New Zealand to increase the representativeness of the HLFS and are used in all analyses in this paper.

[2] We do this because it is not straightforward to interprete changes in return to human capital over time and across groups when a discrete categorisation is used.

total years spent in education minus 5 (that is, the school starting age). This is a necessary approximation for actual labour market experience that is not collected in the NZIS.[3]

Specifically, individuals with no school qualifications are assumed to have spent 9 years in school, those with primary proficiency 10 years, those with level 1 school qualifications (that is, school certificate) 11 years, those with level 2 school qualifications (that is, sixth form exams) 12 years, and those with level 3 or 4 school qualifications (that is, university entrance, higher school certificate, bursary, or scholarship) 13 years. Individuals with overseas school qualifications or other school qualifications are assumed to have spent 11–12 years in school depending on their country of birth.[4]

Similarly, individuals whose highest post-school qualification is a technician's certificate are assumed to have spent 0.5 additional years in post-school education; those whose highest post-school qualification is a trade certificate, advanced trade certificate, or other certificate 1 additional year; those whose highest post–school qualification is a nursing, teaching, local polytechnic, university, or New Zealand certificate or diploma 1.5 additional years; those whose highest post-school qualification is a bachelors degree 3 additional years; and those whose highest post-school qualification is a postgraduate degree, certificate, or diploma 4.5 additional years.

3.3 Measuring labour market outcomes

This paper estimates the relationship between an individual's human capital and whether they are currently employed in any paid job or in an unpaid family job, their total hours of work in a usual week and their real hourly wage, which in a perfectly competitive market corresponds to their relative productivity.

Hourly wages are calculated as usual weekly income from wage/salary employment divided by the usual weekly hours worked in wage/salary employment.[5] Wages are then converted to local 2008 dollars using the official Consumers Price Index (CPI). Individuals with real wages less than $5 per hour or greater than $250 per hour are recoded to missing, along with all individuals with imputed data.[6]

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[3] Dixon (2000) examines whether returns to human capital for women are sensitive to this assumption by calculating proxy measures for actual experience using outside data. She finds that returns to education are understated for women when potential experience is used rather than actual experience. This should be kept in mind when interpreting the results in this paper.

[4] The Barro and Lee (2010) data set on worldwide educational attainment is used to estimate the average years of schooling for individuals who have completed secondary school in different countries.

[5] We focus on wages from wage/salary employment because the NZIS collects only limited data on earnings from self-employment. All results are qualitatively similar when self-employment earnings are included in the wage measure and are available from the author by request.

[6] In Table 2, we show the proportion of wage/salary workers by gender, immigration status, and survey year who have valid wage data. Reassuringly, there is no systematic difference in this source of measurement error between the New Zealand–born and immigrants of either gender.

4 RETURNS TO HUMAN CAPITAL FOR IMMIGRANTS AND THE NEW ZEALAND–BORN

4.1 Characteristics of immigrants and the New Zealand–born

Table 1 presents the mean years of education and years of potential experience for immigrants and the New Zealand–born by gender and survey year. It also highlights the difference in these figures for immigrants and the New Zealand–born of the same gender. Two interesting facts emerge from this table.

First, mean years of education has substantially increased for all four groups (New Zealand–born men, New Zealand–born women, immigrant men, and immigrant women) during the sample period. This increase was a similar magnitude for immigrant and New Zealand–born men (0.58–0.60 years) and for immigrant and New Zealand–born women (0.83–0.93 years) and generally larger for women.

Second, immigrant men have, on average, 0.32–0.52 more years of education than New Zealand–born men. On the other hand, immigrant women have, on average, the same amount of education as New Zealand–born women. This relates to the fact that principal applicants in the skilled migration streams are disproportionately male (Merwood 2010).

Turning to the results for potential experience, we see a large divergence in trends for immigrants compared with the New Zealand–born. In 1997, the average New Zealand–born man had 2.1 years less potential experience than the average immigrant man (combining this with the difference in years of education reveals that they were almost 2.6 years younger), while by 2007, the average New Zealand–born man had 0.4 more years potential experience than the average immigrant man (hence was nearly the same age). This occurred because while potential experience for the average New Zealand–born man in our sample of 25–59-year-olds increased by 1.7 years, it declined by 0.8 years for the average immigrant man. The findings for women are quite similar, with potential experience for New Zealand–born women increasing by 1.4 years during the sample period, while the same figure for immigrant women declined by 0.7 years. These changes mainly occurred from 2004 onwards as the New Zealand labour market experienced a large influx of younger migrants.[7]

Table 1 also examines how our sample composition has changed over time. In 1997, 17 percent of the prime-age population was born outside New Zealand, excluding migrants in the country for less than 5 years. This declined to 16 percent in 2000, before increasingly slowly to 18 percent in 2005 and then more rapidly to 21 percent by 2008. The gender composition of the migrant population is quite similar to that of the New Zealand–born population in all years.

[7] This reflected increases in skill migration dating back to the late 1990s as our sample is restricted to migrants in New Zealand for at least 5 years. It also reflects the movement into the labour force of individuals who migrated to New Zealand as children.

Table 2 presents the mean employment rates, weekly hours worked, real wages, and the proportion of wage/salary workers with valid wage data for immigrants and the New Zealand–born by gender and survey year. Again, it highlights the difference in these figures for immigrants and the New Zealand–born of the same gender. These are the outcome variables in the regression analysis that we undertake in this paper.

Differences in outcomes across groups (and time) occur because: i) there are differences in the characteristics of the individuals in each of these groups; ii) there are differences in the relationship between these characteristics and the outcome measures for different groups; and iii) other unknown causes, such as discrimination, lead to average differences in outcomes across groups. The regression analysis in the next section is used to separate out the importance of the first explanation compared with the other two in explaining observed outcome differences.

First, examining employment rates for men, we see that immigrants generally are less likely to be employed. This gap ranges from 5.9 percentage points in 1998 to 0.5 percentage points in 2004. There is not an obvious pattern over time, and it appears that, on average, employment rates for immigrant men are 2–3 percentage points lower than those for New Zealand–born men over this period.

On the other hand, employment rates for immigrant and New Zealand–born women have diverged during the sample period. In 1997 and 1998, the employment rate for immigrant women was 2 percentage points less than that for New Zealand–born women, this increased to a 4–5 percentage point gap in 1999–2004 and then to a 6–9 percentage point gap in 2005–2009. This occurred because employment rates for New Zealand–born women increased strongly throughout the sample period from 68 percent in 1997 to 76 percent in 2009, while those for immigrant women declined from 66 percent in 1997 to 64 percent in 1999 at the bottom of the recession and had only increased to 71 percent by 2009.

Second, examining hours worked for men, we find similar patterns as for employment. Employed immigrant men work, on average, 3–6 percent fewer hours than employed New Zealand–born men. In contrast to common perception, hours worked has declined over time for both New Zealand–born and immigrant men from 46 hours per week in 1997 for New Zealand–born men and 44 hours per week for immigrant men to 44 hours per week in 2009 for New Zealand–born men and 42 hours per week for immigrant men.

On the other hand, employed immigrant women, on average, work more hours than employed New Zealand–born women. This gap varies over the sample period, but is generally of the order of 3–5 percent, with employed New Zealand–born women working, on average, 32–33 hours per week while employed immigrant women work, on average, 33–36 hours per week.

Third, examining hourly wages for men, we find that wages are generally quite similar for immigrants and the New Zealand–born. The largest gaps are found in 1998 and 2004 where immigrants are found to earn, on average, 5 percent more per hour than the New Zealand–born, and in 2009 where immigrants are found

to earn, on average, 4 percent less per hour than the New Zealand–born. It is worth noting that these seemingly large gaps are only around $1 per hour in dollar instead of percent terms. There is some evidence that real wages have declined for immigrant men between 2007 and 2009, while they have increased for New Zealand-born men leading to an increased wage gap. The results for women are similar although there is no evidence of a recent divergence in wages.

Overall, there appears to be a surprising lack of variation in differences in employment rates, hours worked and real wages for New Zealand–born and immigrants between 1997 and 2009. Given that outcomes relate to both the characteristics of individuals, in particular their human capital, and the average returns to these characteristics in the labour market, we now turn to regression analysis to clearly separate these two components.

4.2 Returns to human capital for the New Zealand–born and immigrants by gender and year

We begin by examining the relationship between human capital and the labour market outcomes discussed above for the New Zealand–born and immigrants by gender and year. We do this by estimating a standard Mincerian (log) wage regression that controls for both the educational attainment and potential experience (in a quadratic) of each individual, as well as additional observable characteristics that are related to wages, including each individual's marital status and household type, the geographic region and urbanisation of their household, and for immigrants the decade in which they arrived in New Zealand and a quadratic for the number of years that they have lived in either country (Mincer 1974).[8]

Separate regression models are estimated for our four sample groups (New Zealand–born men, immigrant men, New Zealand–born women and immigrant women) and for each survey year. In other words, identical regression models are estimated for each of these 52 combinations. Two additional sets of identical regression models are also run where, instead of log wages, the outcomes are whether an individual is employed and conditional on being employed, how many hours per week they worked. For ease of comparison, ordinary least squares (OLS) regression models are used for these two outcomes even though employment is a discrete outcome and hours of work cannot go below zero.

The focus in this paper is on the relationship between years of education and labour market outcomes. While the relationship between potential experience

[8] It is assumed that selection into employment does not have a meaningful impact on the estimated relationship between human capital and wage or hours worked. In other words, the returns to education for workers are assumed to be the same as those for non-workers if they were working. This assumption might be important for examining changes over time for women as observed employment rates have increased significantly for New Zealand–born women during the sample period, and hence the selection of women into the labour market may have changed as well (for example, wage returns to education may be dampened if recent entrants to the labour market are, on average, less ambitious than those who worked in the earlier period).

and outcomes is also of interest, we leave a close examination of this for future work. Table 3 presents the estimated coefficient on years of education from each of the regression models discussed in the previous paragraph along with the appropriate standard errors. These coefficients are also graphed in Figure 1 (employment) and Figure 2 (hours worked) along with 95 percent confidence intervals calculated using the standard errors in Table 3.[9] Figure 3 graphs the results for real hourly wages, but converts the coefficients in Table 3 to percentage changes and graphs confidence intervals for these.[10]

First, examining the results for employment, we find that for each additional year of education, New Zealand–born men have 1.5–2.5 percentage point higher employment rates. This relationship is fairly stable during the sample period, although there is some evidence that this relationship is strongest when the economy is weakest (that is, the coefficients are largest in 1998, 1999, and 2009) implying that less-educated men are relatively less likely to be employed during a recession than during a boom.[11]

The relationship between years of education and employment is statistically indistinguishable for immigrant men compared to New Zealand–born men. On the other hand, the relationship between years of education and employment is stronger for both New Zealand–born and immigrant women than it is for either group of men. For New Zealand–born women, an additional year of education is correlated with 2.5–4.7 percentage point higher employment rates. This relationship appears to becoming weaker over time (that is, there is now less difference in relative employment rates for highly educated women than in the past), but also appears to be stronger during recessions as it is for men. The relationship between education and employment is statistically indistinguishable for immigrant women compared with New Zealand–born women.

Second, examining the results for hours worked, we find that the relationship between education and hours worked has declined over time for both men and women. New Zealand–born men before 2004 worked an additional 0.2–0.4 hours per week for each year of education, but there was no longer a significant relationship between education and hours worked in 2004–09.

The relationship between education and hours worked for immigrant men is estimated much less precisely but generally shows a similar pattern. Education is more strongly related to hours worked for employed New Zealand–born women, with each year of education correlated with an addition 0.6–1.0 hours worked before 2005, declining to 0.4–0.6 hours worked after this. The relationship for immigrant women appears to be weaker, but this is not estimated with enough precision to rule out either no relationship or the same relationship as for New Zealand–born women. Overall, the relationship between education and

[9] This was done using the terrific user-written *parmest* suite of commands for Stata 10 (Newson 2003).

[10] Because the dependent variable in the regression model is log hourly wage, these coefficients can be converted to percent changes using the formula: percent change = 100*[exp(coefficient) – 1].

[11] This is consistent with the findings in Maré and Hyslop (2008) who examine linked employer–employee data and show that less-skilled individuals were drawn into the workforce during the boom in the 2000s.

hours worked is quite weak for New Zealand–born men, all immigrants, and New Zealand–born women since 2005.

Third, examining the results for hourly wages, we find that returns to education for New Zealand–born men have ranged between 7.9 percent and 9.3 percent per year of education over the sample period. An interesting pattern emerges where returns increased from 7.9 percent in 1997 to 9.4 percent in 2003 and then decreased back to 7.9 percent in 2009. Returns to education for immigrant men followed a similar pattern, but as Stillman and Velamuri (2010) found for 2008 and 2009, are generally 1–2 percent higher throughout the sample period.[12] In other words, the difference between the wages of high- and low-skilled immigrants is greater than the difference between the wages of high- and low-skilled New Zealand–born.

Next, examining the results for New Zealand–born women, we see that as found by Dixon (2000), returns to education were lower for women than for men in the late 1990s, but were fairly similar to those for men in the 2000s. Similar to men, returns to education for immigrant women were generally 1–2 percent higher than for New Zealand–born women throughout the sample period. As discussed further by Stillman and Velamuri (2010), this likely reflects that immigrants to New Zealand have 'better' unobserved characteristics that are rewarded in the labour market, such as ambition, although it might also relate to low-skilled immigrants having worse outcomes than low-skilled New Zealand–born for reasons such as poor job networks, having skills that do not translate well to the New Zealand labour market, or discrimination.

Overall, we find that the relationship between education and employment is the same for immigrants and New Zealand–born of the same gender. The same is also found for the relationship between education and hours worked conditional on employment. On the other hand, immigrants earn relatively more in terms of hourly wages than the New Zealand–born for each year of education.

We next turn to examining the extent to which the differences in labour market outcomes observed in Table 2 occur because immigrants have generally different characteristics than the New Zealand–born, or because either the returns to these characteristics differ for immigrants and the New Zealand–born or there are other unexplained differences in outcomes.[13]

[12] It is uncertain why Stillman and Maré (2009) find that returns to university qualifications are lower for immigrants using the same data. This likely relates to their use of controls for qualifications as opposed to converting qualifications to years of education. The approach in this paper is more flexible in some ways because it accounts for the exact combination of school and post-school qualifications that each individual has, but less flexible because it assumes that returns are linear to years of education. The difference in findings may also relate to the exclusion in this paper of immigrants in New Zealand for 5 years or less years.

[13] The characteristics considered here are education, work experience, marital status, household type, and the geographic region and urbanisation of their household. Unexplained differences include anything not captured here, including family obligations, health status, the quality of one's education, the quality of one's job networks, how much motivation individuals have in the office, etc.

4.3 Predicted outcomes for the New Zealand–born and immigrants by gender and year

We next use the regression results estimated in the previous section to calculate the predicted wages for individuals in the different sample groups (that is, New Zealand–born men, immigrant men, New Zealand–born women, and immigrant women) but with otherwise identical characteristics. This allows us to quantify the extent to which labour market outcomes vary because of differences in the observable characteristics included in the regression model compared with other reasons.

Table 4 presents predicted mean employment rates, mean hours worked conditional on employment, and geometric mean hourly wages calculated using the characteristics of the average immigrant across the entire sample period and pooling both genders.[14] In other words, all differences in this table reflect differences in the estimated regression coefficients (including the constant) for each sample group in each year.

First, examining the results for employment, we find that, for both men and women, the predicted employment gap when both groups are assigned the same characteristics is similar to the actual observed differences in employment rates. This indicates that differences in the characteristics of migrants relative to the New Zealand–born do not explain why migrants have lower employment rates than the New Zealand–born. This leaves a number of other possible explanations for the observed lower employment rates for immigrants. This may occur because immigrants have worse job networks, lower effective human capital (perhaps because of language skills), higher reservation wages (perhaps because of different family obligations or less access to informal childcare) or because of labour market discrimination. Further work with different data needs to be done to distinguish between these possible reasons.[15]

It is worth noting that almost all of the gender gap in employment rates also remains unexplained by differences in characteristics, which like the results for immigrants is unsurprising seeing that women and immigrants are generally as or more skilled than New Zealand–born men and skills are positively correlated with employment rates.

Second, examining the results for hours worked, the findings are identical as those for employment. Observable differences in characteristics between immigrants and the New Zealand–born cannot explain why employed immigrant men work, on average, 3–5 percent fewer hours than employed New Zealand–born men, while employed immigrant women work, on average, 2–8 percent more hours than employed New Zealand–born women. Again, this would be an

[14] For hourly wages, the regression coefficients are used to predict log wages, with these predictions then converted to levels. This approach reduces the impact of very high wage rates on the calculation of the sample mean.

[15] For example, detailed data on individual job search behaviour could be used to examine whether equivalent New Zealand–born and immigrants have similar job-finding rates. Similarly, longitudinal employee–employer data could be used to see whether promotion and retention rates differ by immigrant status for otherwise similar employees.

interesting dimension to further explore, but would require more detailed data on individual work preferences and constraints on labour market participation.

Third, examining the results for hourly wages, we find that once we account for the fact that immigrants are, on average, more skilled than the New Zealand–born, immigrants have significantly lower wages than the New Zealand–born. In fact, average wages for both immigrant men and women are generally around 4–8 percent lower than those for New Zealand–born with the same characteristics. As for employment rates, this may occur because immigrants have worse job networks, lower effective human capital (perhaps because of language skills), or because of labour market discrimination.

4.4 Predicted outcomes for the New Zealand–born and Immigrants by gender and education

Since immigrants have higher returns to education than the New Zealand–born, lower average wages among immigrants occur either because less-educated immigrants are doing particular badly relative to less-educated New Zealand–born or because wages are relatively lower for all immigrants, just more so for the less-educated ones. We now examine which of these explanation is correct, as well as examine the relationship between education and differences in employment rates and hours worked for immigrants and the New Zealand–born.

Starting with employment rates, Figure 4 graphs the average difference in actual employment rates between immigrants and the New Zealand–born (called the employment gap) for men and women with different years of education pooling all sample years and assuming a linear relationship between years of education and employment rates for each group.[16] For men, this shows that employment rates are 3 percentage points lower for immigrants with 9 years of education, increasing to nearly 5 percentage points lower for the most educated immigrants. For women, the employment gap is declining with education, with a 7 percentage point gap found for the least educated immigrants and less than a 4 percentage point gap for the most educated.

Figure 4 also graphs the predicted employment gap at each education level when immigrants and the New Zealand–born are both assumed to otherwise have the characteristics of the average immigrant.[17] The results here show that, once differences in characteristics are controlled for, the employment rate gap for immigrant men is estimated to be about 1 percentage point larger at all points in the educational distribution. In other words, the characteristics of immigrants make them more likely than the New Zealand–born to be employed and, once we account for this, immigrants are doing slightly worse off in terms of employment rates than how they initially appear. For women, it is estimated that around a 6.5 percentage point employment gap exists for immigrants at all

[16] In practice, separate regressions are run for New Zealand–born men, immigrant men, New Zealand–born women and immigrant women, each of which includes controls for years of education and the survey year (to account for business cycle effects). 'Actual' employment rates are then calculated for each group using the overall average sample characteristics, which in this case is just the proportion of the sample in each survey year.

[17] The same approach is taken as when calculating actual employment rates, but now the regression models also include the full set of characteristics described in section 4.2.

educational levels once accounting for differences in characteristics. These results suggest that the factors, such as poor job networks, discrimination, higher reservation wages, that lead to lower employment rates affect all immigrants, but have slightly less impact on less-educated male immigrants who have the most similar employment rates to the New Zealand–born.

Figure 5 presents similar results for hours worked. This reveals that the previously discussed immigrant hour worked gap for men is strongest for the least educated workers and declines with education. For example, immigrants with 9 years of education work, on average, 6 percent fewer hours than New Zealand–born men with the same education, while immigrants with 17 years of education work, on average, 2 percent fewer hours than New Zealand–born men.

Interestingly, the finding that immigrant women work more hours than New Zealand–born women turns out to be driven by less educated immigrants as well. For example, employed immigrant women with 9 years of education work, on average, 8 percent more hours than employed New Zealand–born women with the same education, while immigrant women with university degrees work essentially the same average number of hours as similarly educated New Zealand–born women.

Differences in characteristics do not explain either why less-educated male immigrants work fewer hours than similar New Zealand–born men or why less-educated female immigrants work more hours than similar New Zealand–born women. This is a particularly interesting finding that could be the subject of a more in-depth analysis.

Figure 6 presents similar results for hourly wages. For both men and women, immigrants with less then 12 years of education are observed to earn less than New Zealand–born with the same education level, while those with 14 years or more of education earn more. The relationship between education and the immigrant wage gap is stronger for men, with immigrant men with 9 years of education earning 4.4 percent less than New Zealand–born men with the same education, while immigrant men with 17 years of education earn 3.1 percent more than New Zealand–born men with the same education. The equivalent figures for women are 1.7 percent less and 3.5 percent more, respectively.

Once we account for the fact that immigrants are more highly educated than the New Zealand–born along with other differences in characteristics, both immigrant men and women are found to be doing relatively worse at all points in the education distribution than what is concluded from examining actual wages. We also find that the relationship between education and the immigrant wage gap becomes stronger when we control for characteristics. For example, immigrant men (women) with 9 years of education are predicted to have 14.2 percent (8.6 percent) lower hourly wages than otherwise equivalent New Zealand–born men (women), while the predicted gap for immigrants with 12 years of education is 9.3 percent for men and 5.3 percent for women, and the gap for immigrants with 15 years of education is 4.3 percent for men and 2 percent for women. These results suggest that the factors, such as poor job networks and discrimination, that lead to lower wages among immigrants are particularly relevant for the less educated.

5 RETURNS TO HUMAN CAPITAL FOR DIFFERENT IMMIGRANT AND ETHNIC GROUPS

5.1 Characteristics of different immigrant and ethnic groups

Our next analysis takes the same empirical approach as discussed in the previous section but focuses on how outcomes vary for immigrants and the New Zealand–born with different ethnic backgrounds and from different source countries. This is done to potentially illustrate the extent to which different outcomes for immigrants are likely to be related to their immigrant status per se, as opposed to other pertinent characteristics such as their ethnicity.

We now examine outcomes for 14 mutually exclusive groups of immigrants and New Zealand–born: 1) New Zealand–born European/Pākehā ethnicity; 2) New Zealand–born Māori ethnicity; 3) New Zealand–born Pacific ethnicity; 4) New Zealand–born Asian ethnicity; 5) New Zealand–born Other ethnicity; 6) Australian–born European ethnicity; 7) UK–born European ethnicity; 8) Other-born European ethnicity; 9) Foreign-born Māori ethnicity; 10) Foreign-born Pacific ethnicity; 11) Asian-born Asian ethnicity; 12) Pacific Island–born Asian ethnicity (mainly Indo-Fijians); 13) Other-born Asian ethnicity; and 14) Foreign–born Other ethnicity.[18] To keep the analysis manageable, data for the entire sample period are now pooled. This aggregation is supported by the previous analysis that found that most results were qualitatively similar across the entire sample period.

Table 5 presents sample sizes, the mean years of education, and years of potential experience for each immigrant/ethnic group by period. Looking first at the population proportions, we see that New Zealand–born Pākehā/Europeans make up around two-thirds of the population followed by New Zealand–born Māori (13 percent), UK–born Europeans (6 percent), Foreign-born Pasifika, and Other-born Europeans (3 percent each). The only other groups containing more than 1 percent of the working-age population are Foreign-born Other, Asian-born Asians, Australian-born Europeans, and New Zealand–born Pasifika, each with just more than 1 percent of population. Notably, only 30 percent of the working-age population with Pacific ethnicity and 13 percent of the working-age population with Asian ethnicity were born in New Zealand. One final thing to point out is that few immigrants are of Māori ethnicity, so this group is excluded from all further analysis.

Turning to the results for mean years of education, we see that New Zealand–born Pākehā/Europeans have, on average, 12 years of education. In comparison, Foreign-born Pasifika are the least educated with only 10.5 years of education on average, followed by New Zealand–born Māori with 11 years of education. On

[18] Individuals are assigned to one ethnicity using the old Statistics New Zealand prioritisation scheme, which works as follows: an individual who answers Māori in any choice is Māori, an individual who answers Pacific Islander in any choice but not Māori is a Pacific Islander, an individual who answers Asian in any choice but not Māori or Pacific Islander is Asian, an individual who answers Other in any choice but not Māori, Pacific Islander, or Asian is Other, and all remaining individuals are Pākehā/European.

the other hand, New Zealand–born Asians were the most educated with 13.5 years of education on average, followed by Other-born Europeans and Asian-born Asians (13 years). All other groups are within 0.5 years of the average for New Zealand–born Pākehā/Europeans. These findings are generally quite similar for men and women although one noticeable difference is that while among all New Zealand–born groups, women are more educated, the opposite is true for almost all immigrant groups.

Next, examining the results for potential experience, we see that New Zealand–born Pākehā/Europeans have, on average, 25 years of experience. New Zealand–born Pasifika (18 years) and New Zealand–born Asians (19.5 years) have noticeably less experience, while UK-born Europeans have noticeably more experience at 28 years. Differences are less than 2 years between all other groups and New Zealand–born Pākehā/Europeans.

Table 6 presents mean employment rates, weekly hours worked, and real wage/salary wages for each immigrant/ethnic group by period, as well as the proportion of wage/salary workers with valid wage data.

First, examining employment rates for men, we see that 90 percent of New Zealand–born Pākehā/Europeans males were employed during the sample period. In comparison, only 77 percent of New Zealand–born Māori and Foreign-born Pasifika, 79 percent of Foreign-born Other, and 82 percent of Asian-born Asians were employed. Employment rates were also 4–5 percentage points lower for New Zealand–born Pasifika, New Zealand–born Other, Pacific-born Asians, and Other-born Asians.

Turning to the results for women, 76 percent of New Zealand–born Pākehā/Europeans were employed compared with 57 percent of Foreign-born Pasifika and Foreign-born Other, 60 percent of New Zealand–born Māori, 62 percent of Asian-born Asians, 65 percent of New Zealand–born Pasifika, 66 percent of Other-born Asians, and 68 percent of Pacific-born Asians. In contrast, perhaps surprisingly, employment rates were higher for New Zealand–born Asians at 79 percent.

Second, examining hours of work for men, we see that employed New Zealand–born Pākehā/Europeans worked, on average, 46 hours per week. Employed men in most other groups worked fewer hours on average, with the shortest work weeks found for Foreign-born Pasifika and Asian-born Asians (42 hours per week), and New Zealand–born Pasifika, Other-born Asians, and Foreign-born Other (43 hours per week).

On the other hand, employed women in all ethnic/migrant groups worked longer hours than Pākehā/European women, who averaged 33 hours per week. The largest differences were found for New Zealand–born Pasifika, Other Asians, and Pacific-born Asians (37 hours per week) and New Zealand–born Asians, Foreign-born Pasifika, and Asian-born Asians (36 hours per week).

Third, examining hourly wages for men, we found large variation in the average wages for different groups. New Zealand–born Pākehā/Europeans earned, on average, $22.65 per hour. The following groups earned substantially lower wages: Foreign-born Pasifika (32 percent less), New Zealand–born Māori (18 percent less), New Zealand–born Pasifika (18 percent less), Asian-born

Asians (8 percent), and Foreign-born Other and Pacific-born Asians (6 percent less).

On the other hand, the following groups earned substantially higher wages: Other-born Europeans (17 percent more), UK-born Europeans (12 percent more), and Australian-born Europeans (9 percent more). Average wages for the remaining groups were within 5 percent of the average for New Zealand–born Pākehā/Europeans.

Differences for women are similar but generally smaller in magnitude. For example, while New Zealand–born Pākehā/European women earn $18.80 per hour, on average, Foreign-born Pasifika earn 23 percent less, New Zealand–born Māori 12 percent less, New Zealand–born Asians 9 percent more, and Other-born Europeans 12 percent more, with all other groups within 7 percent.

Gender differences are most apparent for New Zealand–born Pasifika, with men in this group earning 18 percent less than New Zealand–born Pākehā/European men, while women in this group only earn 4 percent less than New Zealand–born Pākehā/European women.

It is important to emphasise that the observed differences in both employment rates and wages levels may reflect differences in the average human capital for each group (for example, differences in average levels of education), differences in returns to these characteristics, and/or other unexplained differences. As with the previous analysis, we now turn to regression analysis to separate these components.

5.2 Returns to human capital for immigrant/ethnic groups by gender

We now examine the relationship between human capital and labour market outcomes for each immigrant/ethnic group using the same regression approach as used in section 4.2. Again, we estimate standard Mincerian (log) wage regression that controls for both the educational attainment and potential experience (in a quadratic) of each individual, as well as additional observable characteristics that are related to wages, including each individual's marital status and household type, the geographic region and urbanisation of their household, the sample year, and for immigrants the decade in which they arrived in New Zealand and a quadratic for the number of years that they have lived in either country. Again, separate regression models are estimated for each of the 13 groups separately for each gender.

Table 7 presents the estimated coefficient on years of education from each of the regression models along with the appropriate standard errors. These coefficients are also graphed in Figure 7 (employment) and Figure 8 (hours worked) along with 95 percent confidence intervals calculated using the standard errors in Table 7.[19] Figure 9 graphs the results for real hourly wages, but converts the coefficients in Table 7 to percentage changes and graphs confidence intervals for these.

[19] Again, this was done using the terrific user-written *parmest* suite of commands for Stata 10 (Newson 2003).

First, examining the results for employment, we find that, for each year of education, New Zealand–born Pākehā/European men have 1.3 percentage point higher employment rates while the equivalent figure for women in 3.0 percentage points. For men, this relationship is significantly stronger for New Zealand–born Māori, New Zealand–born Pasifika and New Zealand–born Other, and borderline significantly stronger for Pacific-born Asians and Foreign-born Other. In other words, for these groups, differences in employment rates between the less educated and more educated are greater than that for New Zealand–born Pākehā/European men.

Turning to the results for women, the relationship between education and employment is significantly stronger for New Zealand–born Māori, New Zealand–born Pasifika, Foreign-born Pasifika, Pacific-born Asians, and Foreign-born Other.

Next, examining the results for hours worked, we find that, for each year of education, New Zealand–born Pākehā/European men work 0.07 more hours per week while New Zealand–born Pākehā/European women work 0.7 more hours per week. The relationship between education and hours worked for men is significant stronger for New Zealand–born Māori and Foreign-born Pasifika. Interestingly, for Asian-born Asian men, education is significantly negatively related to hours worked, with individuals in this group working 0.5 hours less per week for every year of education.

For women, the relationship between education and hours worked is significantly stronger for New Zealand–born Māori. In contrast, this relationship is significantly weaker for New Zealand–born Asians, Foreign-born Pasifika, Asian-born Asians, Other-born Asians, and Foreign-born Other. In fact, for each of these groups there appears to be little relationship between education and hours worked.

Finally, examining the results for real hourly wages, we find that, for each year of education, New Zealand–born Pākehā/European men receive 8.4 percent higher hourly wages, while New Zealand–born Pākehā/European women receive 7.9 percent higher hourly wages. In contrast to the results in Maani (2004), we do not find evidence of higher returns to education for New Zealand–born Māori. This quite likely reflects that fact that Maani (2004) examined differences in income in the census, so her results reflect the relationship between education and hours worked (which is found to be stronger for New Zealand–born Māori than for New Zealand–born Pākehā/Europeans) and the relationship between education and wages.

However, the relationship between education and wages for men is found to be significantly stronger for New Zealand–born Asians (10.8 percent higher wages per year of education), Asian-born Asians (10.7 percent), and Pacific-born Asians (11.3 percent). Similarly, for women, the relationship between education and wages is found to be significantly stronger for Asian-born Asians (9.7 percent) and Other-born Asians (11.9 percent) and marginally significantly stronger for New Zealand–born Asians (10.6 percent).

These results are consistent with employed individuals in these groups being, on average, more ambitious or having other unobserved characteristics that lead them to have higher wages than similarly educated New Zealand–born

Pākehā/Europeans. But, the steeper education–wage gradient for these groups could also reflect particularly low wages relative to New Zealand–born Pākehā/Europeans for less-educated Asians. This would be consistent with the findings in section 4.4 that the immigrant wage gap is largest for the least educated migrants.

One group is also identified as having lower wage returns to education than New Zealand–born Pākehā/Europeans; Foreign-born Pasifika men earn only 6.4 percent higher earnings for each year of education. This could reflect education in the Pacific being viewed as lower quality, but one would then expect to find similar results for Foreign-born Pasifika women.

5.3 Predicted outcomes for immigrant/ethnic groups by gender

In our final section of results, we use the regression results estimated in the previous section to calculate the predicted wages for individuals in each sample groups but with otherwise identical characteristics. This allows us to quantify the extent to which labour market outcomes vary because of differences in observable characteristics compared with other reasons. Table 8 presents predicted mean employment rates, mean hours worked conditional on employment, and geometric mean hourly wages calculated again using the characteristics of the average immigrant across the entire sample period.[20] In other words, all differences in this table reflect differences in the estimated regression coefficients for each sample group.

First, examining the results for employment, we find that differences in characteristics explain most of the employment differences between New Zealand–born Māori, New Zealand–born Pasifika and New Zealand–born Pākehā/Europeans. If all three groups had, on average, the characteristics of the average migrant, employment rates would only be 5 percentage points (2 percentage points) lower for New Zealand–born Māori men (women) rather than 14 percentage points and 16 percentage points lower in actuality, respectively. Similarly, employment rates would be nearly the same for New Zealand–born Pasifika as New Zealand–born Pākehā/Europeans.

On the other hand, almost none of the large observed gap in employment rates for Foreign-born Pacific, Asian-born Asians, Pacific-born Asians, and Foreign-born Other relative to New Zealand–born Pākehā/Europeans is explained by differences in characteristics.

This leaves a number of other possible explanations for the observed lower employment rates for these immigrants. This may occur because immigrants have worse job networks, lower effective human capital (perhaps because of worse English language skills), higher reservation wages (perhaps because of different family obligations or less access to informal childcare) or because of labour market discrimination. Further work with more detailed data needs to be

[20] For hourly wages, the regression coefficients are used to predict log wages, with the mean and confidence intervals for these predictions then converted to levels. This approach reduces the impact of very high wage rates on the calculation of the sample mean.

done to distinguish between these possible reasons. It is worth noting that at least when looking at employment gaps, it is immigrant status rather than ethnicity that is driving poor outcomes for Asians and Pasifika in New Zealand.

Next, examining the results for hours of work reveals that differences in characteristics do not explain any of the observed variation in hours worked across groups or the large different in the patterns for women compared with men. Again, further work with more detailed data is needed to uncover what is driving these differences.

Finally, examining the results for wages reveals that, unlike for employment rates, little of the wage gap for New Zealand–born Māori and New Zealand–born Pasifika relative to New Zealand–born Pākehā/Europeans is explained by differences in characteristics. Similarly, the lack of an observed wage gap for New Zealand–born Asians hides the fact that, once we adjust for their higher levels of observed skill, wages are predicted to be 15 percent lower for men and 8 percent lower for women than for equivalent skilled New Zealand–born Pākehā/Europeans.

Differences in observed characteristics also explain almost none of the 23–32 percent observed lower wages for Foreign-born Pasifika and, once difference in observed characteristics are accounted for, sizable wage gap are revealed for Asian-born Asians (15–24 percent lower wages), Pacific-born Asians (14–19 percent lower wages), and Other-born Asians (5–18 percent lower wages).

Overall, once controlling for differences in characteristics, all Māori, Pasifika, and Asians are found to have much lower wages than individuals with Pākehā/European, European or Other ethnicity regardless of whether they are immigrants (although the estimated wage gaps are generally larger for ethnic immigrants than the New Zealand–born minority groups, particularly for women). This suggests that labour market discrimination may play an important role in wage setting, although other explanations, such as lower quality education, worse job networks, or occupational segregation, could also explain these findings.

6 CONCLUSIONS

In this paper, unit record survey data from the 1997–2009 New Zealand Income Survey (NZIS) is used to examine how labour market outcomes and returns to human capital vary in the immigrant and non–immigrant populations in New Zealand and whether these returns vary over time and across business cycles. First, regression analysis is used to estimate the relationship between education and employment, hours worked and wages for immigrants and the New Zealand–born separately for men and women, controlling for other factors that are related to individual wages. These relationships are allowed to vary over time to see whether any variation is systematically related to business cycles or other macroeconomic variation.

Then, the same empirical approach is used to examine the relationship between education and labour market outcomes for immigrants and New Zealand–born with different ethnic backgrounds and from different source countries, again separately for men and women. This part of the analysis extends previous work to simultaneously consider the relationship between immigrant status and ethnicity, and labour market outcomes. This may help to illustrate the extent to which different outcomes for immigrants are likely related to their immigrant status per se, rather than other pertinent characteristics, such as their ethnicity.

The four main findings from the first part of the analysis are as follows.

First, the relationship between education and both employment and hours worked conditional on employment is the same for immigrants and New Zealand–born of the same gender. On the other hand, immigrants earn relative more in terms of hourly wages than the New Zealand–born for each year of education.

Second, differences in characteristics do not explain the observed lower employment rates for both male and female migrants and the shorter average work hours of male migrants and longer average work hours of female migrants. Accounting for differences in characteristics indicates that the average wage for immigrants is 4–8 percent lower than the average wage for an equivalent New Zealand–born individual.

Third, while differences in employment rates occur across the educational distribution, the observed differences in hours worked and the estimated immigrant wage gap occur mostly among less-educated workers. In fact, immigrants with university education and above generally have quite similar hours worked and wages as the New Zealand–born with the same level of education, although they have lower employment rates.

Fourth, there is a surprising lack of variation in differences in employment rates, hours worked, and real wages for New Zealand–born and immigrants between 1997 and 2009. This suggests that, at least over this period, the business cycle did not have differential impacts on labour market outcomes for migrants and the New Zealand–born.

Further examining how labour market outcomes vary for immigrants and New Zealand–born with different ethnic backgrounds and from different source countries reveals the following findings.

First, differences in characteristics explain most of the large employment gap, particularly for men, between New Zealand–born Māori, New Zealand–born Pasifika, and New Zealand–born Pākehā/Europeans. On the other hand, almost none of the large observed gap in employment rates for Foreign-born Pacific, Asian-born Asians, Pacific-born Asians, and Foreign-born Other relative to New Zealand–born Pākehā/Europeans is explained by differences in characteristics.

Second, unlike for employment rates, little of the wage gap for New Zealand–born Māori and New Zealand–born Pasifika relative to New Zealand–born Pākehā/Europeans is explained by differences in characteristics. Similarly, once controlling for the different average characteristics of each group, large wage gaps are found for New Zealand–born Asians, Foreign-born Pasifika, Asian-born Asians, Pacific-born Asians, and Other-born Asians.

Overall, these results indicate that when looking at employment gaps, it is immigrant status as opposed to ethnicity that is driving poor outcomes for Asians and Pacific Islanders in New Zealand. Interpreted along with the evidence from the first analysis that immigrants at all levels of education have lower employment rates than equivalent New Zealand–born, these results are consistent with Asian and Pasifika immigrants having worse job networks or higher reservation wages, perhaps because of different family obligations or less access to informal childcare, or being affected by labour market discrimination.

It is also possible that lower employment rates occur because these immigrants have lower effective human capital than equally educated New Zealand–born, perhaps because of worse English language skills, but in this case one would expect to find bigger employment differences among less-educated migrants since this is presumably the group for whom poor English language skills are most common.

On the other hand, Māori, Pasifika and Asians are found to have much lower wages than individuals with European or Other ethnicity regardless to whether they are immigrants. Interpreted along with the evidence from the first analysis that it is only less educated migrants that have much lower wages than equivalent less educated New Zealand–born, these results suggests that labour market discrimination may play an important role in wage setting among less educated Māori, Pasifika and Asians in New Zealand. However, other possible explanations, such as lower quality education, worse job networks, or occupational segregation could also explain these findings.

Unfortunately, the NZIS is not well suited for distinguishing in an empirical sense the relative importance of each of these possible explanations for worse labour market outcomes among individuals in different ethnic/immigrant groups in New Zealand. Hence, further work with different data needs to be done to differentiate between these possible reasons. For example, detailed data on individual job search behaviour could be used to examine whether equivalent New Zealand–born Pākehā/Europeans, members of minority ethnic groups, and

immigrants have similar job-finding rates. Similarly, longitudinal employee–employer data could be used to see whether promotion and retention rates differ by ethnicity and immigrant status for otherwise similar employees or whether certain groups of workers appear to be paid less than what they contribute to firm productivity (for example, Hellerstein et al 2002).

Figure 1: Relationship Between Years of Education and Employment for NZ-Born and Immigrants by Gender and Year

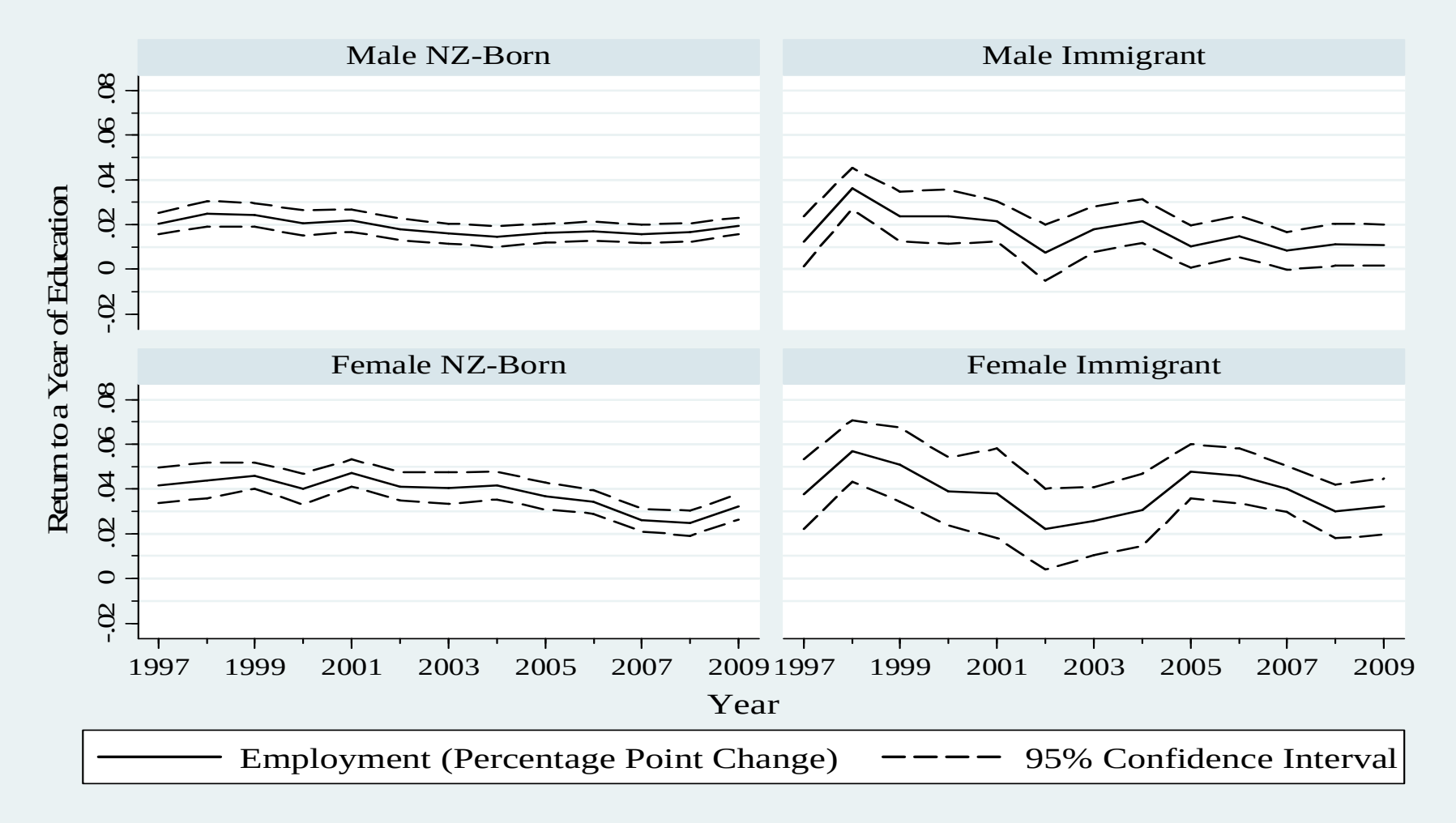

Figure 2: Relationship Between Years of Education and Hours of Work for NZ-Born and Immigrants by Gender and Year

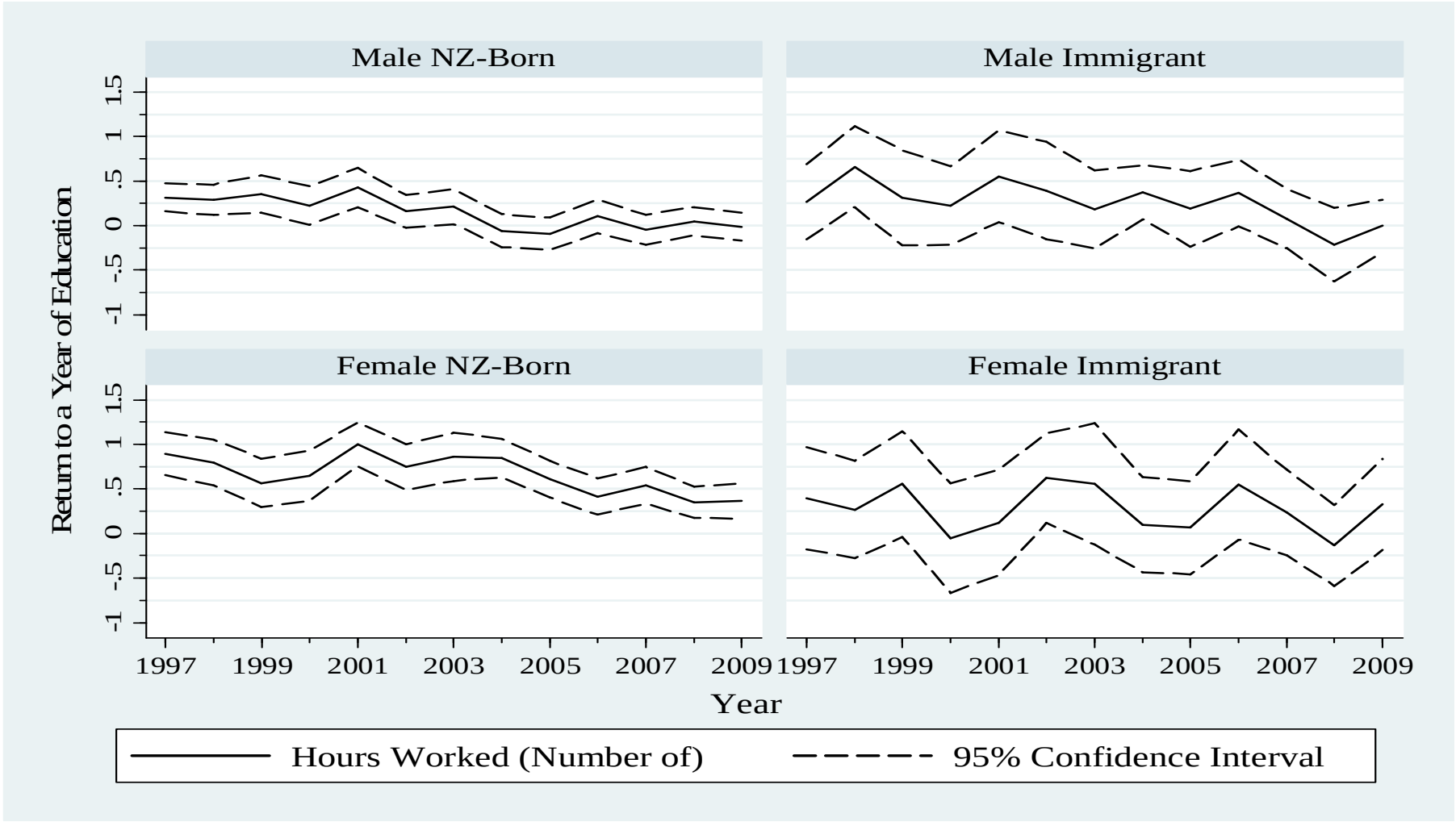

Figure 3: Relationship Between Years of Education and Wages for NZ-Born and Immigrants by Gender and Year

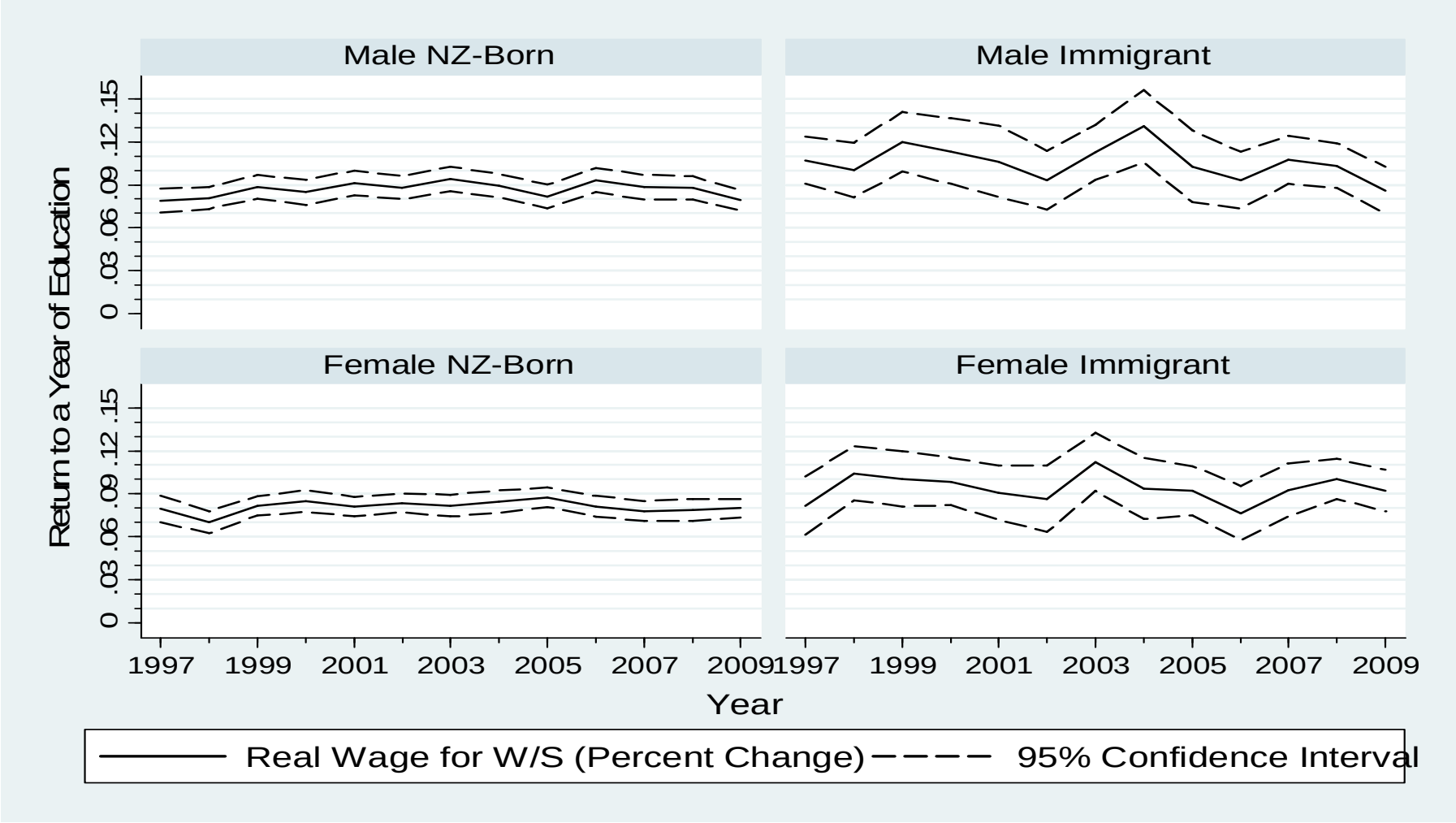

Figure 4: Actual and Predicted Employment Rate Gaps for NZ-Born and Immigrants by Gender and Years of Education

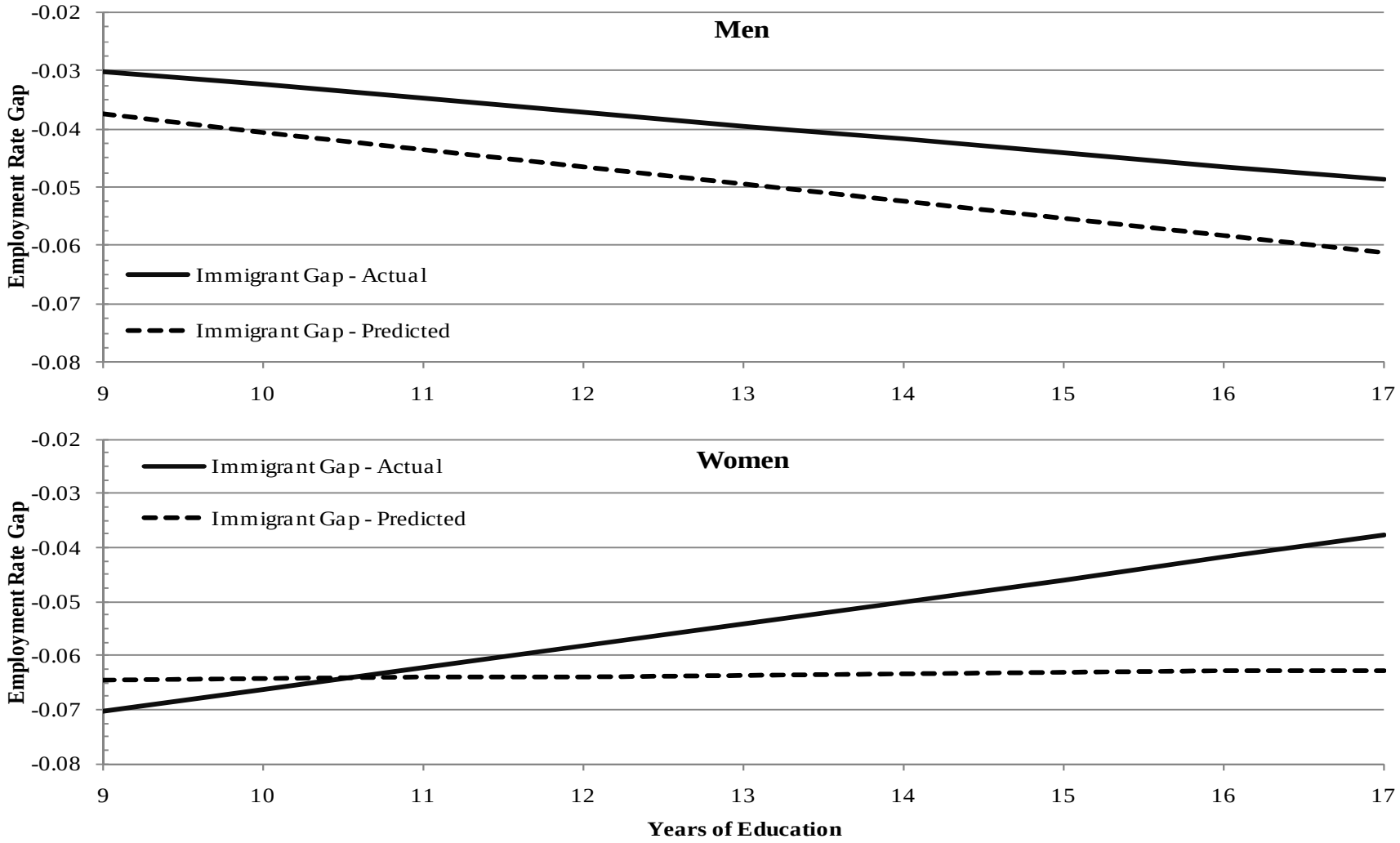

Figure 5: Actual and Predicted Hours Work Gaps for NZ-Born and Immigrants by Gender and Years of Education

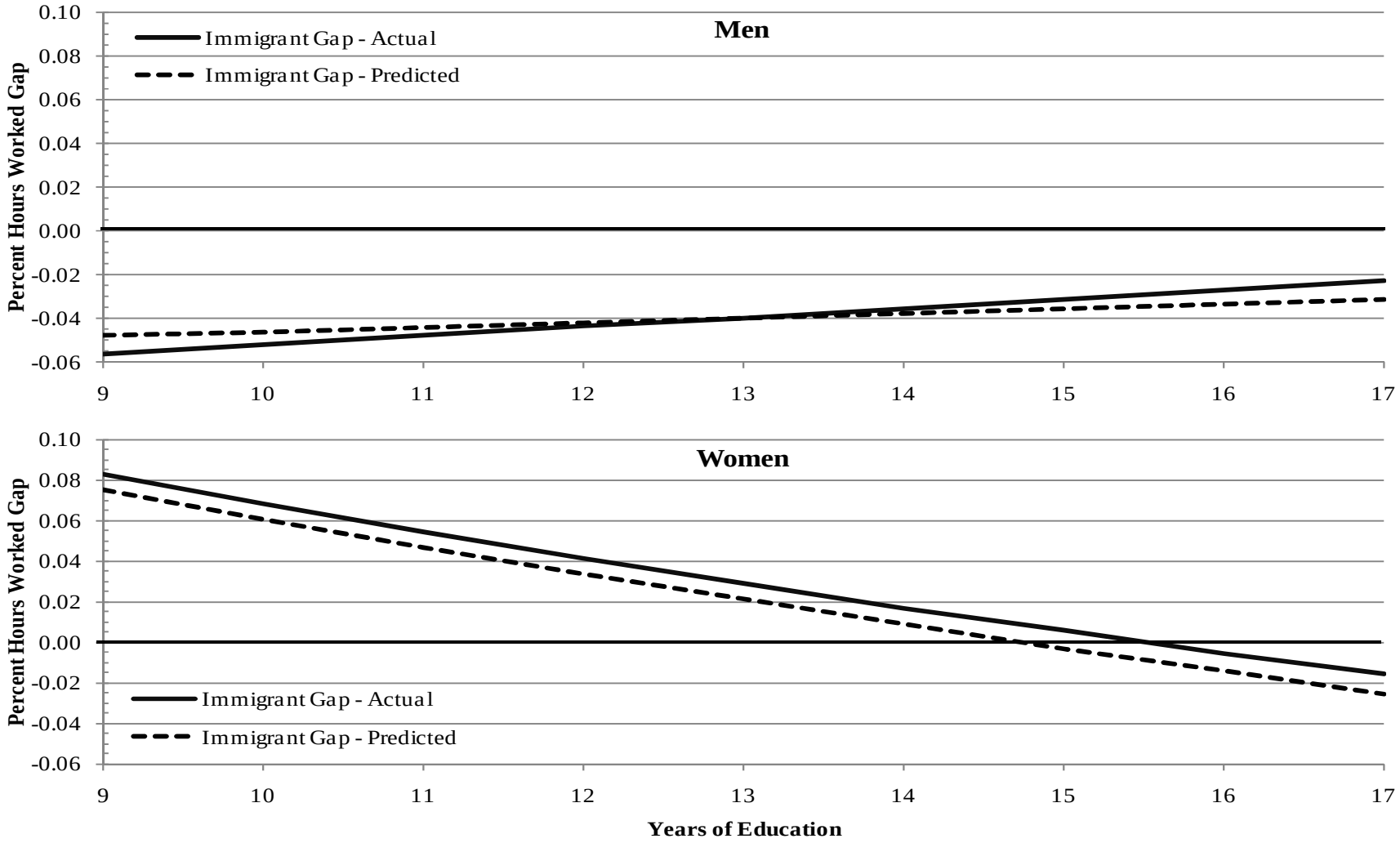

Figure 6: Actual and Predicted Wage Gaps for NZ-Born and Immigrants by Gender and Years of Education

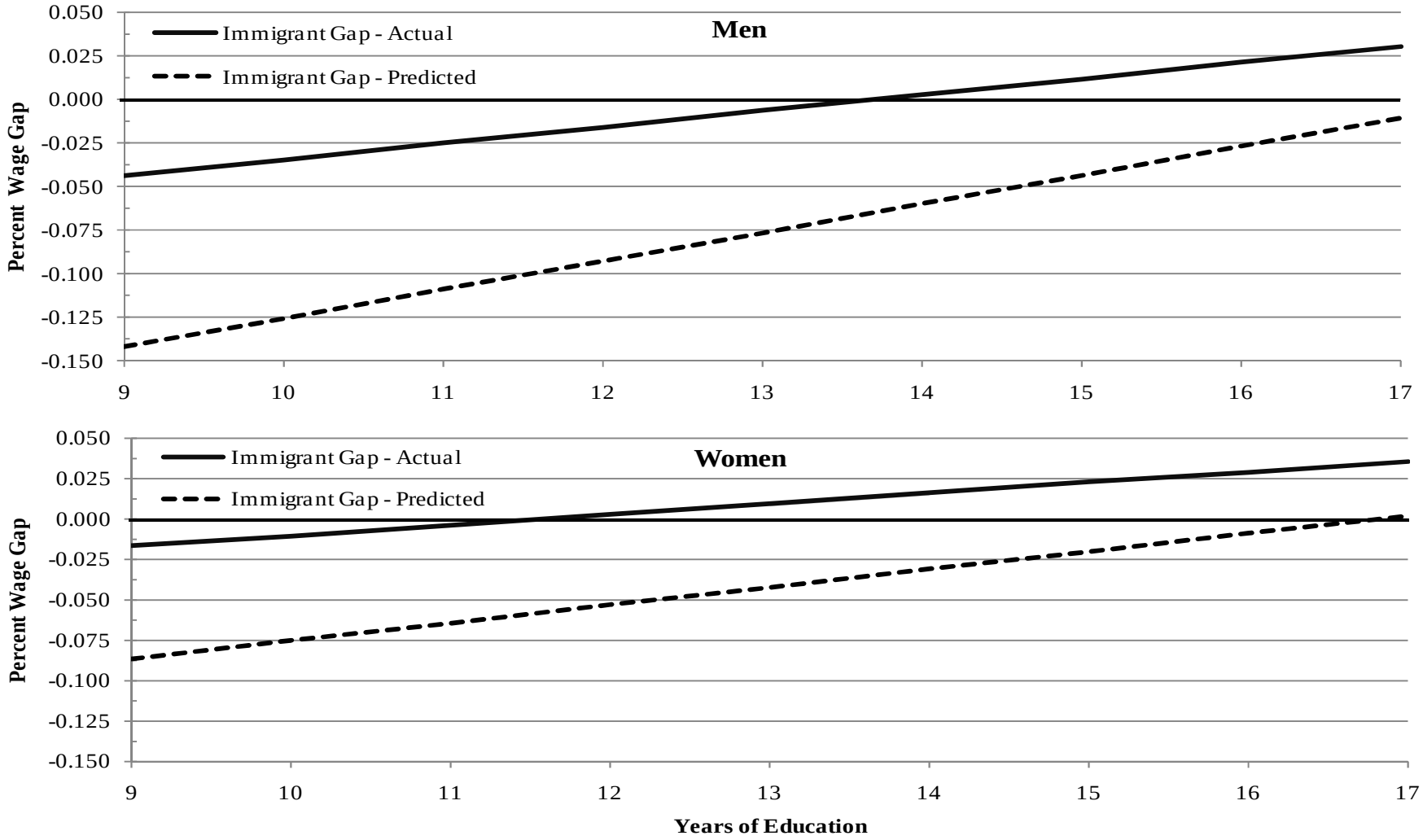

Figure 7: Relationship Between Years of Education and Employment for NZ-Born and Immigrants by Ethnicity and Gender

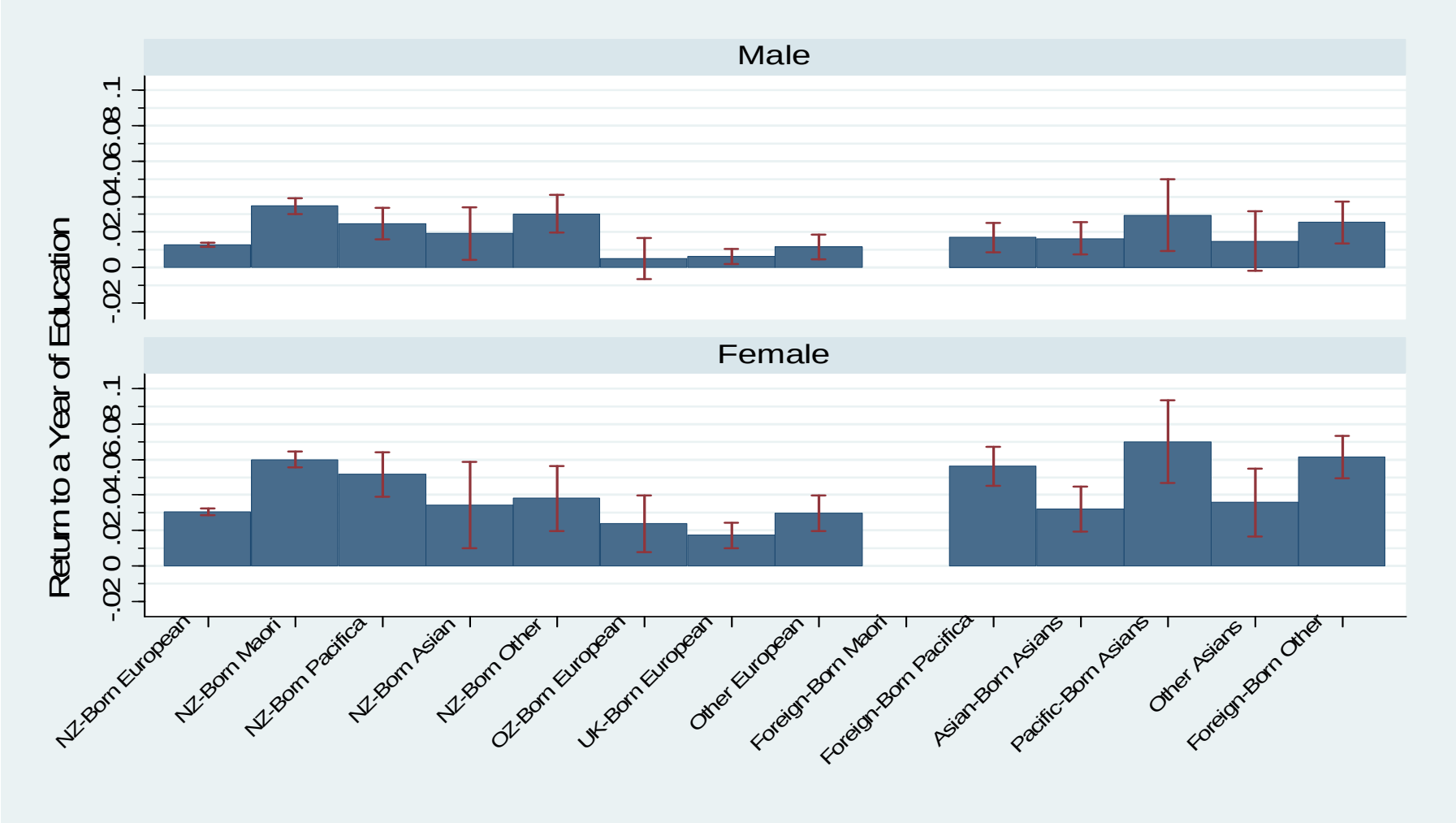

Figure 8: Relationship Between Years of Education and Hours of Work for NZ-Born and Immigrants by Ethnicity and Gender

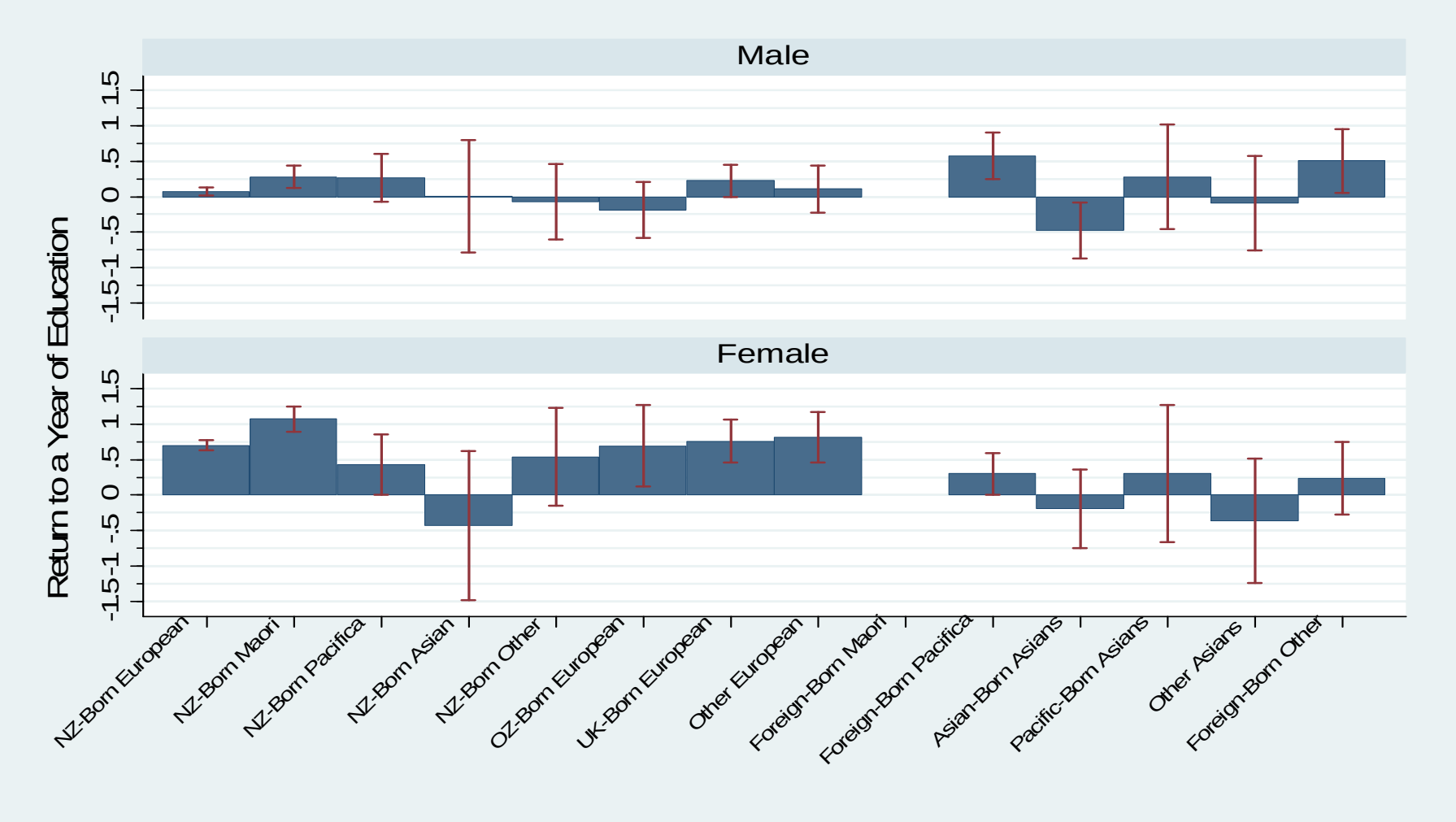

Figure 9: Relationship Between Years of Education and Wages for NZ-Born and Immigrants by Ethnicity and Gender

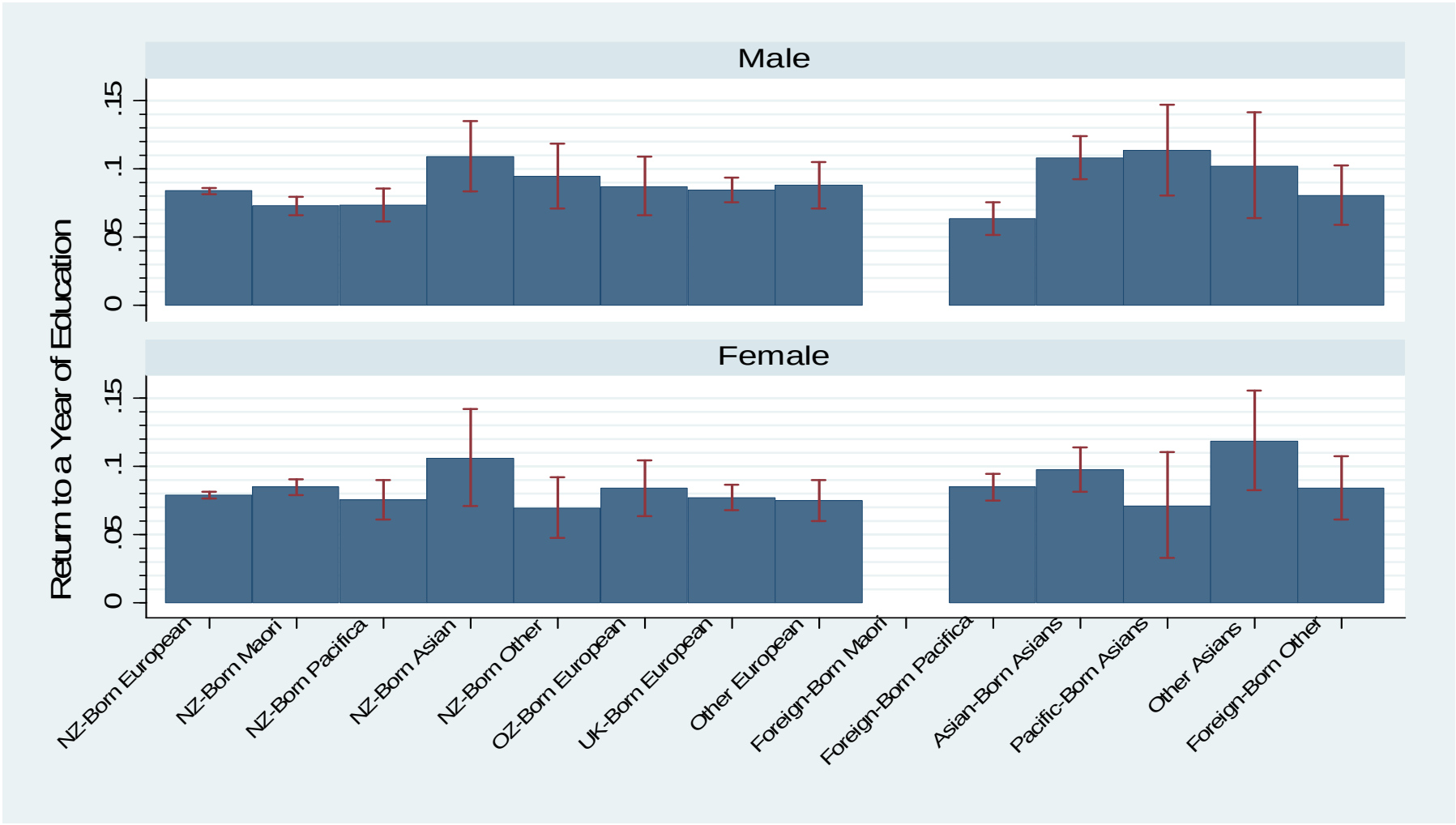

Table 1: Observable Skills Among NZ-Born and Immigrants by Gender and Year

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mean Years of Education													
Male NZ-Born	11.54	11.61	11.60	11.71	11.77	11.79	11.85	11.90	12.04	12.05	12.08	12.14	12.14
Male Immigrant	12.00	11.99	12.00	12.05	12.32	12.22	12.19	12.29	12.36	12.36	12.55	12.66	12.58
Female NZ-Born	11.47	11.57	11.65	11.68	11.77	11.80	11.96	12.05	12.14	12.16	12.37	12.45	12.40
Female Immigrant	11.62	11.72	11.71	11.68	12.11	12.09	12.04	12.00	12.16	12.25	12.48	12.56	12.45
Male Imm-NZ	0.46	0.38	0.40	0.35	0.55	0.42	0.34	0.39	0.32	0.32	0.47	0.52	0.44
Female Imm-NZ	0.15	0.15	0.06	0.00	0.34	0.29	0.08	-0.05	0.02	0.08	0.11	0.12	0.05
Mean Years of Potential Expenience													
Male NZ-Born	23.57	23.59	23.80	23.91	24.18	24.31	24.44	24.66	24.91	25.05	25.01	25.14	25.28
Male Immigrant	25.67	26.38	26.58	26.81	26.17	26.49	26.63	26.27	26.24	26.02	25.28	24.47	24.88
Female NZ-Born	23.50	23.57	23.71	23.82	23.96	24.10	24.15	24.30	24.50	24.62	24.47	24.52	24.87
Female Immigrant	25.41	25.61	26.03	26.54	26.32	26.28	26.35	26.58	26.00	26.06	25.61	25.11	24.71
Male Imm-NZ	2.10	2.79	2.78	2.90	1.99	2.18	2.19	1.62	1.34	0.97	0.27	-0.66	-0.40
Female Imm-NZ	1.91	2.03	2.32	2.72	2.36	2.18	2.20	2.28	1.50	1.45	1.15	0.59	-0.16
Proportion of the Overall Population													
Male NZ-Born	40.7%	40.8%	40.7%	41.1%	41.0%	40.8%	40.7%	40.5%	39.5%	39.4%	39.1%	38.1%	38.1%
Male Immigrant	8.5%	8.2%	8.2%	7.8%	7.8%	7.9%	8.0%	8.1%	8.8%	9.0%	9.2%	10.2%	10.2%
Female NZ-Born	41.9%	42.4%	42.8%	43.1%	42.9%	42.6%	42.2%	42.8%	42.6%	42.1%	41.1%	40.6%	40.9%
Female Immigrant	9.0%	8.6%	8.3%	8.0%	8.4%	8.8%	9.1%	8.7%	9.2%	9.6%	10.6%	11.1%	10.9%
Sample Size													
Male NZ-Born	6,522	6,506	6,174	6,411	6,286	6,695	6,524	6,196	5,783	5,562	5,866	5,773	5,746
Male Immigrant	1,382	1,308	1,220	1,136	1,123	1,227	1,242	1,211	1,222	1,207	1,300	1,373	1,415
Female NZ-Born	7,235	7,286	6,950	7,286	7,142	7,564	7,303	7,090	6,620	6,434	6,760	6,453	6,656
Female Immigrant	1,502	1,426	1,312	1,251	1,274	1,425	1,432	1,355	1,349	1,373	1,581	1,632	1,629

Notes: See the paper for further information on how the variables are defined. All figures incorporate sampling weights except for the sample size.

Table 2: Labour Market Outcomes for NZ-Born and Immigrants by Gender and Year

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Employment Rate													
Male NZ-Born	0.874	0.862	0.854	0.867	0.873	0.884	0.885	0.891	0.896	0.902	0.896	0.892	0.884
Male Immigrant	0.830	0.803	0.829	0.839	0.853	0.860	0.852	0.886	0.861	0.854	0.885	0.880	0.852
Female NZ-Born	0.681	0.668	0.698	0.694	0.714	0.720	0.730	0.734	0.757	0.770	0.767	0.769	0.763
Female Immigrant	0.663	0.646	0.644	0.650	0.672	0.664	0.679	0.679	0.686	0.685	0.695	0.707	0.706
Male Imm-NZ	-0.044	-0.059	-0.025	-0.028	-0.020	-0.024	-0.033	-0.005	-0.035	-0.048	-0.011	-0.012	-0.032
Female Imm-NZ	-0.018	-0.022	-0.054	-0.044	-0.042	-0.056	-0.051	-0.055	-0.071	-0.085	-0.072	-0.062	-0.057
Mean Weekly Work Hours if Employed (Percent Differences)													
Male NZ-Born	46.2	46.1	45.7	45.3	45.6	45.4	45.1	45.4	45.5	45.2	45.3	44.9	44.3
Male Immigrant	44.4	43.9	43.7	43.5	44.2	43.7	42.8	42.8	43.8	43.8	43.7	42.5	42.4
Female NZ-Born	32.6	31.9	32.1	32.5	32.6	33.1	32.8	32.9	33.3	33.2	33.6	33.2	33.1
Female Immigrant	34.2	33.5	33.1	33.3	34.8	35.7	35.0	34.5	33.5	34.0	34.4	34.3	34.0
Male Imm-NZ (%)	-0.04	-0.05	-0.04	-0.04	-0.03	-0.04	-0.05	-0.06	-0.04	-0.03	-0.03	-0.05	-0.04
Female Imm-NZ (%)	0.05	0.05	0.03	0.02	0.07	0.08	0.07	0.05	0.01	0.03	0.02	0.03	0.03
Mean Real Hourly Wage if Wage/Salary Employed (Geometric Mean, Percent Differences)													
Male NZ-Born	20.70	20.66	21.28	20.70	21.31	21.14	21.48	21.71	22.65	22.60	23.45	23.69	24.12
Male Immigrant	21.05	21.65	21.71	21.50	21.87	21.05	22.44	22.90	23.64	22.49	23.52	23.55	23.27
Female NZ-Born	16.98	17.25	17.74	17.74	17.74	17.76	18.25	18.54	18.80	19.20	19.89	19.97	20.39
Female Immigrant	16.78	17.67	17.41	18.01	18.50	18.07	19.34	18.32	18.63	18.77	21.28	20.64	20.55
Male Imm-NZ (%)	0.02	0.05	0.02	0.04	0.03	0.00	0.04	0.05	0.04	0.00	0.00	-0.01	-0.04
Female Imm-NZ (%)	-0.01	0.02	-0.02	0.02	0.04	0.02	0.06	-0.01	-0.01	-0.02	0.07	0.03	0.01
Proportion of Wage/Salary Employed w/ Valid Wage Data													
Male NZ-Born	0.699	0.836	0.808	0.806	0.815	0.829	0.836	0.829	0.832	0.830	0.791	0.811	0.827
Male Immigrant	0.688	0.829	0.817	0.808	0.825	0.835	0.845	0.804	0.845	0.811	0.756	0.792	0.804
Female NZ-Born	0.733	0.867	0.850	0.862	0.855	0.862	0.866	0.858	0.855	0.847	0.832	0.833	0.861
Female Immigrant	0.727	0.831	0.846	0.844	0.848	0.853	0.850	0.843	0.844	0.845	0.819	0.837	0.853
Male Imm-NZ	-0.011	-0.007	0.009	0.002	0.010	0.006	0.009	-0.025	0.013	-0.019	-0.035	-0.019	-0.023
Female Imm-NZ (%)	-0.006	-0.036	-0.004	-0.018	-0.007	-0.009	-0.016	-0.015	-0.011	-0.002	-0.013	0.004	-0.008

Notes: See the paper for further information on how the variables are defined. Wages are in 2008 NZD. All figures incorporate sampling weights.

Table 3: Relationship Between Years of Education and Outcomes for NZ-Born and Immigrants by Gender and Year

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Employment Rate													
Male NZ-Born	0.0205**	0.0249**	0.0244**	0.0207**	0.0218**	0.0178**	0.0160**	0.0146**	0.0162**	0.0171**	0.0158**	0.0165**	0.0195**
	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Male Immigrant	0.0125*	0.0361**	0.0236**	0.0236**	0.0214**	0.007	0.0180**	0.0216**	0.0103*	0.0148**	0.00827+	0.0111*	0.0110*
	(0.006)	(0.005)	(0.006)	(0.006)	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)	(0.005)	(0.005)
Female NZ-Born	0.0417**	0.0438**	0.0460**	0.0400**	0.0472**	0.0411**	0.0404**	0.0416**	0.0369**	0.0342**	0.0260**	0.0248**	0.0322**
	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Female Immigrant	0.0377**	0.0570**	0.0508**	0.0388**	0.0381**	0.0221*	0.0256**	0.0307**	0.0478**	0.0459**	0.0400**	0.0300**	0.0321**
	(0.008)	(0.007)	(0.008)	(0.008)	(0.010)	(0.009)	(0.008)	(0.008)	(0.006)	(0.006)	(0.005)	(0.006)	(0.006)
Weekly Work Hours if Employed													
Male NZ-Born	0.317**	0.291**	0.355**	0.225*	0.428**	0.159+	0.215*	-0.057	-0.091	0.105	-0.046	0.050	-0.012
	(0.080)	(0.087)	(0.107)	(0.109)	(0.111)	(0.093)	(0.099)	(0.094)	(0.092)	(0.096)	(0.086)	(0.081)	(0.079)
Male Immigrant	0.266	0.662**	0.313	0.225	0.554*	0.394	0.182	0.375*	0.190	0.367+	0.079	-0.213	-0.003
	(0.213)	(0.228)	(0.272)	(0.222)	(0.259)	(0.276)	(0.220)	(0.155)	(0.215)	(0.190)	(0.169)	(0.209)	(0.150)
Female NZ-Born	0.897**	0.795**	0.568**	0.649**	0.999**	0.744**	0.861**	0.846**	0.610**	0.414**	0.540**	0.351**	0.363**
	(0.123)	(0.130)	(0.139)	(0.141)	(0.124)	(0.130)	(0.137)	(0.110)	(0.105)	(0.103)	(0.104)	(0.090)	(0.099)
Female Immigrant	0.399	0.269	0.554+	-0.052	0.122	0.622*	0.556	0.099	0.066	0.549+	0.235	-0.134	0.327
	(0.289)	(0.277)	(0.300)	(0.309)	(0.299)	(0.254)	(0.344)	(0.270)	(0.265)	(0.312)	(0.244)	(0.231)	(0.260)
Log Real Hourly Wage if Wage/Salary Employed													
Male NZ-Born	0.0759**	0.0777**	0.0847**	0.0814**	0.0874**	0.0843**	0.0899**	0.0856**	0.0786**	0.0892**	0.0846**	0.0842**	0.0762**
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)
Male Immigrant	0.102**	0.0955**	0.113**	0.107**	0.101**	0.0890**	0.107**	0.123**	0.0977**	0.0890**	0.102**	0.0984**	0.0827**
	(0.007)	(0.009)	(0.009)	(0.010)	(0.011)	(0.010)	(0.009)	(0.011)	(0.012)	(0.009)	(0.008)	(0.007)	(0.008)
Female NZ-Born	0.0764**	0.0677**	0.0783**	0.0815**	0.0780**	0.0802**	0.0786**	0.0810**	0.0839**	0.0782**	0.0749**	0.0759**	0.0769**
	(0.004)	(0.004)	(0.003)	(0.004)	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)
Female Immigrant	0.0784**	0.0991**	0.0956**	0.0939**	0.0868**	0.0827**	0.106**	0.0893**	0.0881**	0.0736**	0.0886**	0.0957**	0.0881**
	(0.010)	(0.009)	(0.009)	(0.008)	(0.009)	(0.011)	(0.009)	(0.010)	(0.008)	(0.009)	(0.009)	(0.006)	(0.007)

Notes: ** p<0.01, * p<0.05, + p<0.1. Each cell is a regression coefficient from a separate regression model. Robust standard errors in parentheses that account for survey clustering. Each regression also controls for each individual's potential experience (quadratic), marital status, household type, and the geographical region and urbanisation of the household. Regression models for immigrants also control years in NZ (quadratic) and ten-year arrival cohorts.

Table 4: Predicted Labour Market Outcomes for NZ-Born and Immigrants by Gender and Year

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Employment Rate													
Male NZ-Born	0.894	0.892	0.882	0.884	0.881	0.896	0.894	0.900	0.903	0.906	0.898	0.894	0.890
Male Immigrant	0.843	0.816	0.879	0.835	0.908	0.920	0.837	0.878	0.854	0.862	0.877	0.863	0.849
Female NZ-Born	0.741	0.722	0.751	0.722	0.741	0.746	0.745	0.742	0.760	0.780	0.766	0.765	0.768
Female Immigrant	0.714	0.674	0.679	0.722	0.760	0.669	0.693	0.693	0.696	0.679	0.709	0.669	0.690
Male Imm-NZ	-0.051	-0.075	-0.002	-0.049	0.027	0.025	-0.057	-0.022	-0.049	-0.044	-0.021	-0.032	-0.041
Female Imm-NZ	-0.027	-0.048	-0.072	0.000	0.019	-0.077	-0.052	-0.049	-0.064	-0.101	-0.057	-0.096	-0.078
Act Male Imm-NZ	-0.044	-0.059	-0.025	-0.028	-0.020	-0.024	-0.033	-0.005	-0.035	-0.048	-0.011	-0.012	-0.032
Act Female Imm-NZ	-0.018	-0.022	-0.054	-0.044	-0.042	-0.056	-0.051	-0.055	-0.071	-0.085	-0.072	-0.062	-0.057
Mean Weekly Work Hours if Employed (Percent Differences)													
Male NZ-Born	46.1	46.5	46.0	44.8	45.0	44.9	44.6	45.0	45.4	45.0	44.8	44.5	44.1
Male Immigrant	44.4	44.5	43.4	41.9	45.5	42.3	42.2	42.6	43.6	43.5	43.7	43.2	42.1
Female NZ-Born	32.4	32.3	32.6	32.6	33.2	33.5	32.9	33.1	33.5	33.3	33.3	32.8	33.0
Female Immigrant	35.9	35.2	34.6	32.4	35.3	33.2	34.9	34.7	34.1	33.7	34.9	33.8	33.5
Male Imm-NZ (%)	-0.04	-0.04	-0.05	-0.07	0.01	-0.06	-0.05	-0.05	-0.04	-0.03	-0.02	-0.03	-0.04
Female Imm-NZ (%)	0.11	0.09	0.06	-0.01	0.06	-0.01	0.06	0.05	0.02	0.01	0.05	0.03	0.02
Act Male Imm-NZ (%)	-0.04	-0.05	-0.04	-0.04	-0.03	-0.04	-0.05	-0.06	-0.04	-0.03	-0.03	-0.05	-0.04
Act Female Imm-NZ (%)	0.05	0.05	0.03	0.02	0.07	0.08	0.07	0.05	0.01	0.03	0.02	0.03	0.03
Mean Real Hourly Wage if Employed (Geometric Mean, Percent Differences)													
Male NZ-Born	22.51	23.08	23.96	22.76	23.68	23.58	23.90	24.05	24.27	23.80	25.13	25.00	25.44
Male Immigrant	21.95	22.17	25.20	22.19	22.29	21.08	22.15	22.31	22.69	21.59	22.60	23.08	24.25
Female NZ-Born	17.90	18.17	18.95	19.04	18.88	18.98	19.26	19.41	19.45	19.95	20.30	20.46	20.67
Female Immigrant	17.00	17.27	17.52	17.47	18.27	17.14	18.99	18.12	18.11	18.27	20.73	19.19	19.32
Male Imm-NZ (%)	-0.03	-0.04	0.05	-0.03	-0.06	-0.11	-0.08	-0.08	-0.07	-0.10	-0.11	-0.08	-0.05
Female Imm-NZ	-0.05	-0.05	-0.08	-0.09	-0.03	-0.10	-0.01	-0.07	-0.07	-0.09	0.02	-0.06	-0.07
Act Male Imm-NZ (%)	0.02	0.05	0.02	0.04	0.03	0.00	0.04	0.05	0.04	0.00	0.00	-0.01	-0.04
Act Female Imm-NZ (%)	-0.01	0.02	-0.02	0.02	0.04	0.02	0.06	-0.01	-0.01	-0.02	0.07	0.03	0.01

Notes: Figures are predicted values from the regression models discussed in the paper using the characteristics of the average immigrant and the appropriate settings for the control variables. The figures for actual differences are copies directly from the appropriate rows in Table 2.

Table 5: Observable Skills by Among NZ-Born and Immigrants by Ethnicity and Gender

Gender	NZ-Born European	NZ-Born Maori	NZ-Born Pacifica	NZ-Born Asian	NZ-Born Other	OZ-Born European	UK-Born European	Other European	Foreign-Born Maori	Foreign-Born Pacifica	Asian-Born Asians	Pacific-Born Asians	Other Asians	Foreign-Born Other
						Mean Years of Education								
Male	12.05	10.82	11.40	13.56	12.17	12.44	12.41	12.98	11.51	10.53	13.11	12.20	12.67	12.73
Female	12.15	11.00	11.78	13.56	12.44	12.31	12.18	12.88	12.01	10.64	12.76	11.80	12.53	12.30
Male	Relative to	-1.23	-0.65	1.50	0.12	0.39	0.36	0.93	-0.55	-1.52	1.06	0.15	0.62	0.68
Female	NZ-Euro	-1.15	-0.36	1.41	0.30	0.16	0.03	0.73	-0.13	-1.50	0.62	-0.34	0.39	0.16
						Mean Years of Potential Expenience								
Male	24.77	23.58	18.39	19.97	24.05	24.51	28.22	26.72	23.57	26.40	22.12	23.54	23.02	23.65
Female	24.58	23.01	17.95	19.13	23.67	25.44	28.55	26.16	21.46	25.63	23.04	22.82	22.57	24.12
Male	Relative to	-1.19	-6.38	-4.80	-0.72	-0.26	3.46	1.95	-1.20	1.64	-2.65	-1.23	-1.75	-1.12
Female	NZ-Euro	-1.57	-6.63	-5.45	-0.91	0.86	3.98	1.58	-3.12	1.05	-1.54	-1.76	-2.01	-0.46
						Proportion of the Overall Population								
Male	67.3%	12.6%	1.3%	0.5%	0.7%	0.9%	5.8%	2.8%	0.1%	3.0%	2.2%	0.6%	0.6%	1.7%
Female	66.0%	13.5%	1.4%	0.5%	0.6%	1.1%	5.3%	2.8%	0.1%	3.3%	2.3%	0.6%	0.6%	1.8%
						Sample Size								
Male	66,195	11,399	1,363	425	662	864	5,212	2,397	103	3,687	1,657	517	507	1,422
Female	72,743	15,150	1,710	482	694	1,179	5,230	2,641	124	4,479	1,955	566	591	1,776

Notes: See the paper for further information on how the variables are defined. All figures incorporate sampling weights except for the sample size. Results are not presented for Foreign-born Maori because of the small sample size.

Table 6: Labour Market Outcomes for NZ-Born and Immigrants by Ethnicity and Gender

Gender	NZ-Born European	NZ-Born Maori	NZ-Born Pacifica	NZ-Born Asian	NZ-Born Other	OZ-Born European	UK-Born European	Other European	Foreign-Born Pacifica	Asian-Born Asians	Pacific-Born Asians	Other Asians	Foreign-Born Other
Employment Rate													
Male	0.904	0.766	0.854	0.876	0.857	0.891	0.901	0.896	0.768	0.819	0.864	0.861	0.793
Female	0.756	0.600	0.652	0.788	0.745	0.721	0.760	0.756	0.567	0.617	0.678	0.662	0.574
Male	Relative to	-0.138	-0.050	-0.028	-0.047	-0.013	-0.003	-0.008	-0.136	-0.085	-0.040	-0.043	-0.111
Female	NZ-Euro	-0.156	-0.104	0.032	-0.011	-0.035	0.004	0.000	-0.189	-0.139	-0.078	-0.094	-0.182
Mean Weekly Work Hours if Employed (Percent Differences)													
Male	45.6	43.8	43.1	44.3	46.1	45.0	44.2	44.0	41.5	42.4	44.2	43.4	42.8
Female	32.6	33.9	37.1	36.2	33.5	33.2	32.9	33.2	36.2	35.7	36.6	37.1	34.4
Male	% Relative	-0.04	-0.06	-0.03	0.01	-0.01	-0.03	-0.04	-0.09	-0.07	-0.03	-0.05	-0.06
Female	to NZ-Euro	0.04	0.14	0.11	0.03	0.02	0.01	0.02	0.11	0.10	0.12	0.14	0.06
Mean Real Hourly Wage if Wage/Salary Employed (Geometric Mean, Percent Differences)													
Male	22.65	18.90	18.88	23.48	23.86	24.88	25.41	26.76	16.43	20.84	21.39	21.74	21.26
Female	18.84	16.76	18.01	20.64	18.93	20.11	20.23	21.26	14.98	18.62	17.78	19.41	18.71
Male	% Relative	-0.18	-0.18	0.04	0.05	0.09	0.12	0.17	-0.32	-0.08	-0.06	-0.04	-0.06
Female	to NZ-Euro	-0.12	-0.04	0.09	0.00	0.06	0.07	0.12	-0.23	-0.01	-0.06	0.03	-0.01
Proportion of Wage/Salary Employed w/ Valid Wage Data													
Male	0.818	0.783	0.799	0.831	0.797	0.811	0.801	0.807	0.811	0.804	0.739	0.817	0.814
Female	0.850	0.823	0.840	0.846	0.805	0.851	0.840	0.844	0.838	0.810	0.805	0.822	0.818
Male	Relative to	-0.035	-0.019	0.013	-0.021	-0.007	-0.017	-0.011	-0.007	-0.014	-0.079	-0.001	-0.004
Female	NZ-Euro	-0.027	-0.010	-0.004	-0.045	0.001	-0.010	-0.006	-0.012	-0.040	-0.045	-0.028	-0.032

Notes: See the paper for further information on how the variables are defined. Wages are in 2008 NZD. All figures incorporate sampling weights.

Table 7: Relationship Between Years of Education and Outcomes for NZ-Born and Immigrants by Ethnicity and Gender

Gender	NZ-Born European	NZ-Born Maori	NZ-Born Pacifica	NZ-Born Asian	NZ-Born Other	OZ-Born European	UK-Born European	Other European	Foreign-Born Pacifica	Asian-Born Asians	Pacific-Born Asians	Other Asians	Foreign-Born Other
						Employment Rate							
Male	0.0128**	0.0347**	0.0248**	0.0193*	0.0303**	0.005	0.00631**	0.0118**	0.0170**	0.0165**	0.0295**	0.0149+	0.0254**
	(0.001)	(0.002)	(0.005)	(0.008)	(0.005)	(0.006)	(0.002)	(0.004)	(0.004)	(0.005)	(0.010)	(0.008)	(0.006)
Female	0.0304**	0.0600**	0.0517**	0.0344**	0.0381**	0.0238**	0.0173**	0.0297**	0.0562**	0.0321**	0.0700**	0.0358**	0.0614**
	(0.001)	(0.002)	(0.006)	(0.012)	(0.009)	(0.008)	(0.004)	(0.005)	(0.006)	(0.006)	(0.012)	(0.010)	(0.006)
						Weekly Work Hours if Employed							
Male	0.0699*	0.277**	0.263	0.005	-0.073	-0.185	0.225+	0.107	0.574**	-0.476*	0.277	-0.089	0.502*
	(0.029)	(0.081)	(0.171)	(0.400)	(0.269)	(0.200)	(0.115)	(0.169)	(0.165)	(0.202)	(0.373)	(0.337)	(0.227)
Female	0.702**	1.070**	0.428*	-0.430	0.539	0.693*	0.759**	0.814**	0.301*	-0.193	0.304	-0.365	0.235
	(0.035)	(0.092)	(0.217)	(0.533)	(0.349)	(0.291)	(0.155)	(0.182)	(0.150)	(0.281)	(0.490)	(0.445)	(0.258)
						Log Real Hourly Wage if Wage/Salary Employed							
Male	0.0805**	0.0703**	0.0709**	0.103**	0.0904**	0.0836**	0.0811**	0.0843**	0.0616**	0.102**	0.107**	0.0970**	0.0774**
	(0.001)	(0.003)	(0.006)	(0.012)	(0.011)	(0.010)	(0.004)	(0.008)	(0.006)	(0.007)	(0.015)	(0.018)	(0.010)
Female	0.0759**	0.0814**	0.0728**	0.101**	0.0673**	0.0805**	0.0742**	0.0723**	0.0814**	0.0930**	0.0686**	0.112**	0.0806**
	(0.001)	(0.003)	(0.007)	(0.016)	(0.011)	(0.010)	(0.004)	(0.007)	(0.005)	(0.008)	(0.018)	(0.017)	(0.011)

Notes: ** p<0.01, * p<0.05, + p<0.1. Each cell is a regression coefficient from a separate regression model. Robust standard errors in parentheses that account for survey clustering. Each regression also controls for each individual's potential experience (quadratic), gender, marital status, household type, and the geographical region and urbanisation of the household. Regression models for immigrants also control years in NZ (quadratic) and ten-year arrival cohorts.

Table 8: Predicted Labour Market Outcomes for NZ-Born and Immigrants by Ethnicity and Gender

Gender	NZ-Born European	NZ-Born Maori	NZ-Born Pacifica	NZ-Born Asian	NZ-Born Other	OZ-Born European	UK-Born European	Other European	Foreign-Born Pacifica	Asian-Born Asians	Pacific-Born Asians	Other Asians	Foreign-Born Other
						Employment Rate							
Male	0.911	0.857	0.925	0.858	0.871	0.911	0.910	0.893	0.805	0.788	0.780	0.820	0.776
Female	0.760	0.743	0.741	0.740	0.752	0.710	0.752	0.731	0.658	0.589	0.730	0.705	0.600
Male	Relative to	-0.054	0.013	-0.053	-0.040	0.000	-0.001	-0.018	-0.106	-0.123	-0.131	-0.091	-0.136
Female	NZ-Euro	-0.017	-0.018	-0.020	-0.008	-0.049	-0.007	-0.029	-0.102	-0.171	-0.030	-0.054	-0.159
Act Male	Relative to	-0.138	-0.050	-0.028	-0.047	-0.013	-0.003	-0.008	-0.136	-0.085	-0.040	-0.043	-0.111
Act Female	NZ-Euro	-0.156	-0.104	0.032	-0.011	-0.035	0.004	0.000	-0.189	-0.139	-0.078	-0.094	-0.182
						Mean Weekly Work Hours if Employed (Percent Differences)							
Male	45.2	44.6	43.6	45.4	46.9	45.1	43.8	43.7	42.9	45.4	44.7	42.9	42.7
Female	32.5	35.9	37.2	35.9	33.2	33.0	32.3	32.5	36.3	37.2	36.8	37.2	34.5
Male	% Relative	-0.01	-0.04	0.00	0.04	0.00	-0.03	-0.03	-0.05	0.00	-0.01	-0.05	-0.06
Female	to NZ-Euro	0.10	0.14	0.10	0.02	0.02	-0.01	0.00	0.12	0.14	0.13	0.14	0.06
Act Male	% Relative	-0.04	-0.06	-0.03	0.01	-0.01	-0.03	-0.04	-0.09	-0.07	-0.03	-0.05	-0.06
Act Female	to NZ-Euro	0.04	0.14	0.11	0.03	0.02	0.01	0.02	0.11	0.10	0.12	0.14	0.06
						Mean Real Hourly Wage if Wage/Salary Employed (Geometric Mean, Percent Differences)							
Male	24.67	21.47	20.79	21.17	25.73	25.86	26.03	24.54	18.17	19.43	21.40	20.66	21.24
Female	19.68	18.71	18.43	18.11	18.49	20.66	20.70	19.77	16.49	16.89	16.21	18.66	18.74
Male	% Relative	-0.14	-0.17	-0.15	0.04	0.05	0.05	-0.01	-0.31	-0.24	-0.14	-0.18	-0.15
Female	to NZ-Euro	-0.05	-0.07	-0.08	-0.06	0.05	0.05	0.00	-0.18	-0.15	-0.19	-0.05	-0.05
Act Male	% Relative	-0.18	-0.18	0.04	0.05	0.09	0.12	0.17	-0.32	-0.08	-0.06	-0.04	-0.06
Act Female	to NZ-Euro	-0.12	-0.04	0.09	0.00	0.06	0.07	0.12	-0.23	-0.01	-0.06	0.03	-0.01

Notes: Figures are predicted values from the regression models discussed in the paper using the characteristics of the average immigrant and the appropriate settings for the control variables. The figures for actual differences are copies directly from the appropriate rows in Table 6.

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