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New Zealand Research on the Economic Impacts of Immigration 2005-2010: Synthesis and Research Agenda

Rob Hodgson and Jacques Poot

New Zealand Research on the Economic Impacts of Immigration 2005-2010: Synthesis and Research Agenda

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Non-Technical Abstract

This paper brings together the key research findings of some 20 projects conducted in New Zealand on the economic impacts of immigration from 2005 to 2010. Besides providing a synthesis of this research, knowledge gaps that could be addressed in future research are also identified. The report concludes that immigration has made a positive contribution to economic outcomes in New Zealand and that fears for negative economic impacts such as net fiscal costs, lower wages, and increasing unemployment find very little support in the available empirical evidence. Moreover, the economic integration of immigrants is broadly successful. Once migrants are in New Zealand for more than 10–15 years, their labour market outcomes are predominantly determined by the same success factors as those for the New Zealand born. Migration increases trade and tourism, both inbound and outbound. The net fiscal impact of immigration is positive. Findings on impacts on housing and on technological change are less conclusive. Simulations over a 15-year period with a CGE model suggest that even without additional technological change, additional immigration raises gross domestic product (GDP) per capita, albeit only modestly. Conversely, without net immigration, GDP per capita would be less. The CGE model simulations also suggest that changes in immigration policy and changes in the New Zealand economy over the last quarter century now yield greater economic benefits from immigration than in the past. Future research should focus on: the path of adjustment of the economy over time, following a change in the level of immigration; physical and human capital investment in the economy triggered by immigration; the economic consequences of greater diversity; and differences in impacts between temporary and long-term migration.

Keywords: immigration, integration, labour markets, housing, trade, innovation, fiscal impact, innovation, CGE modelling, New Zealand.

JEL Classification: D58, F22, J15, J18, J61.

New Zealand Research on the Economic Impacts of Immigration

2005-2010: Synthesis and Research Agenda^{*}

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Abstract

This paper brings together the key research findings of some 20 projects conducted in New Zealand on the economic impacts of immigration from 2005 to 2010. Besides providing a synthesis of this research, knowledge gaps that could be addressed in future research are also identified. The report concludes that immigration has made a positive contribution to economic outcomes in New Zealand and that fears for negative economic impacts such as net fiscal costs, lower wages, and increasing unemployment find very little support in the available empirical evidence. Moreover, the economic integration of immigrants is broadly successful. Once migrants are in New Zealand for more than 10–15 years, their labour market outcomes are predominantly determined by the same success factors as those for the New Zealand born. Migration increases trade and tourism, both inbound and outbound. The net fiscal impact of immigration is positive. Findings on impacts on housing and on technological change are less conclusive. Simulations over a 15-year period with a CGE model suggest that even without additional technological change, additional immigration raises gross domestic product (GDP) per capita, albeit only modestly. Conversely, without net immigration, GDP per capita would be less. The CGE model simulations also suggest that changes in immigration policy and changes in the New Zealand economy over the last quarter century now yield greater economic benefits from immigration than in the past. Future research should focus on: the path of adjustment of the economy over time, following a change in the level of immigration; physical and human capital investment in the economy triggered by immigration; the economic consequences of greater diversity; and differences in impacts between temporary and long-term migration.

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1 INTRODUCTION AND BACKGROUND

New Zealand is one of very few countries in which immigrants account for about one-quarter of the population.¹ Although a substantial number of New Zealanders move abroad every year, either temporarily or permanently, the number of foreign-born people arriving to live in New Zealand exceeds the net loss of New Zealanders.² How different would the country have looked without these new residents of Aotearoa New Zealand? Of course, there would have been less cultural diversity, fewer languages spoken and fewer people around. But the country would also have been different in other fundamental ways: demographically, socially, economically, institutionally, and even environmentally.

It is clear that the question of how immigration affects New Zealand is an important one that requires contributions from many disciplines. This report takes the perspective from the discipline of economics, not because other aspects of immigration are unimportant, but because the impact of immigration is most frequently gauged in economic terms; for example, the extent to which immigrants relieve skill shortages or contribute to local demand in cities and towns. Moreover, a full multidisciplinary impact assessment of immigration is beyond the scope of this report. Furthermore, many research projects conducted from 2005 to 2010 focused on specific aspects of the economic consequences of immigration in New Zealand. Therefore, this report summarises the conclusions of these studies.

The unprecedented increase in geographical mobility globally has triggered considerable attention around the assessment of consequences of international migration in other developed countries as well.³ As in New Zealand, economic issues are often at the fore of public debate, but concern is growing about social cohesion. There is now even a textbook devoted to the economics of immigration (Bodvarsson and Van den Berg, 2009). Of course, the implications for countries that are the main sources of international migrants—and which often have a lower standard of living—are potentially significant as well.⁴

For many countries, particularly in Europe, the economic consequences of immigration is a relatively new issue, as such countries have tended to be either largely unaffected by international migration or sources of emigrants rather than hosts of immigrants. By contrast, economists in New Zealand and the other 'New World' countries have discussed, and even formally analysed, the economic consequences of immigration for many years.

From post–World War II to 1983

During the post–World War II period until 1983, the research into the economic impacts of immigration in New Zealand predominantly took a broad macroeconomic perspective and focused on the additional demand that would be generated by an increased population in the form of immigrants.

¹ Other developed countries in which more than 25 percent of the population were born abroad are Australia, Luxembourg, Switzerland, and Israel. In the United States, the country with the largest number of immigrants, immigrants account for only one-eighth of the population.

² For a detailed discussion of New Zealand immigration and emigration numbers over the last three decades, see Bedford and Poot (2010).

³ See, for example, Hanson (2008), Pekkala Kerr and Kerr (2009), and Longhi et al (2010a, 2010b).

⁴ The implications of emigration for development are extensively reviewed in UNDP (2009).

Given that the New Zealand economy during this period had significant international trade barriers and virtually no unemployment, economists then warned that immigration would lead to labour shortages (due to the greater domestic demand), increasing inflation, and a larger balance of payments deficit. They also pointed out that immigration was likely to channel investment funds into housing, public buildings, and roads rather than to new machinery and equipment for businesses. Interestingly, economists expected the latter type of capital to be associated with productivity growth and technological change.⁵

From 1984 to 2004

From 1984 to 2004, the focus of research on the economic impacts of immigration shifted from macroeconomics to the microeconomics of the labour market, changes in various sectors of the economy, international trade, and the economic integration of immigrants. This development was driven by the emergence of large-scale computer models of the economy and new opportunities to analyse data on narrowly defined groups and individuals (facilitated by increasingly sophisticated statistical software and computer power).

A major milestone during this period was the use of a so-called computable general equilibrium (CGE) model that was able to calculate the consequences of a range of immigration scenarios from the national accounts down to the level of individual sectors, skill groups of workers, exports, and consumption commodities.⁶

An important aspect of the economic impact of immigration is the impact on the public sector. By using data on direct and indirect taxes paid by immigrants and the New Zealand-born population, as well as the extent to which public expenditure can be attributed to them, several studies carried out between 1984 and 2004 attempted to measure the net (additional taxes minus additional expenditures) fiscal impact of immigration.⁷

New Zealand's immigration policies had changed radically by the mid 1980s (including the removal of a 'traditional source countries' preference in admissions) and again by the early 1990s (through the introduction of the 'points system' to select skilled immigrants), and a concern emerged about the settlement outcomes of new arrivals. Using census data, which provided information on the number of years migrants had been in New Zealand, it became possible to follow cohorts of migrants by means of successive censuses and assess the extent to which their economic outcomes trended toward those of the New Zealand born.⁸ Given the near-complete removal of trade barriers over the decade since the era of economic liberalisation beginning in 1984, it also became imperative to assess the extent to which immigration from particular source countries affected imports and exports.⁹

⁵ Such issues are discussed in Belshaw (1952), Gould (1964), Holmes (1966a, 1966b, 1967), Monetary and Economic Council (1966), and McGill (1981).

⁶ The simulations are discussed in Poot et al (1988). The model disaggregated the economy into 22 production sectors, 10 skill groups of workers, 17 groups of exports commodities, and 8 groups of consumption commodities. The scenarios ranged from net emigration of 15,000 people year to net immigration of the same number.

⁷ Detailed discussions are in Poot et al (1988), Nana and Williams (1999), and Nana et al (2003).

⁸ The changes in migration policies in the late 1980s and early 1990s are documented in Trlin (1992) and Trlin (1997) respectively. The first cohort analysis of immigrant 'adaptation' in the New Zealand labour market was conducted by Poot (1993). This was followed by a far more extensive analysis by Winkelmann and Winkelmann (1998).

⁹ Bryant et al (2004) developed a so-called gravity model of trade between New Zealand and some 170 countries over 1981 to 2001. They included the stock of migrants from a particular country as an additional variable to explain exports to that country and imports from that country.

This body of research from 1984 to 2004 showed general agreement that the economic impacts for New Zealanders were positive overall or at worst generally benign, and that immigrants had, for the most part, successfully integrated into the New Zealand labour market.¹⁰ Following higher levels of immigration, income per head was calculated to remain, at worst, basically the same, but there was also evidence of economies of scale and investment-induced productivity growth when the number of immigrants increased. The CGE model showed that increased immigration meant generally lower consumer prices. The fiscal balance was shown to have improved, and trade certainly expanded, although the effect on imports exceeded that on exports. Immigrants arriving between 1984 and 2004 often started with substantially lower earnings than the comparable New Zealand-born population, but the entry disadvantage gradually disappeared over their working life. The only negative finding was that less-skilled workers from non-English-speaking backgrounds during the 1990s took relatively longer to integrate into the New Zealand economy than earlier unskilled immigrants or their skilled counterparts.¹¹

While partial analyses for particular groups of immigrants or particular parts of the economy (for example, the housing market or manufacturing exports) can be insightful, an integrated or holistic approach is needed to account for the interactions between the various facets of the economy. Such an approach is particularly helpful when comparing the implications of different policy options. By 2004, it became clear that the results of Poot et al (1988)—thus far the only attempt at an holistic approach in New Zealand—were no longer informative, given how radically New Zealand and the world had changed since the early 1980s. Therefore, the Department of Labour commissioned a scoping paper to investigate how new research on the economics of immigration should be conducted (Poot and Cochrane, 2004). The scoping paper recommended that a multi-stage approach be used, whereby many of the assumptions fed into a CGE model are separately and independently investigated, and that the findings of these investigations should motivate the specification of new simulations with a CGE model of the New Zealand economy.

From 2005 to present

The scoping paper by Poot and Cochrane (2004) provided the impetus for the government-funded Cross-Departmental Research Programme. This programme commissioned nine projects on the economic impacts of immigration between 2005 and 2009. Additionally, about 11 projects not funded through this programme were conducted in New Zealand over the same period and with broadly the same focus. Together, these projects cover a wide range of economic consequences of immigration for the migrants and for New Zealand society generally.

¹⁰ The results from Poot et al (1988), Nana and Williams (1999), Nana et al (2003), and Bryant et al (2004) are all consistent in this respect.

¹¹ Both Poot (1993) and Winkelmann and Winkelmann (1998) demonstrated convergence of immigrant incomes to those of the New Zealand born, although the number of years required for 'catching up' varied between the two studies. Winkelmann and Winkelmann (1998) detected less successful integration of recent unskilled migrants from non-English-speaking backgrounds arriving during the 1990s. This research is being updated and extended in the 2007–2012 Integration of Immigrants Programme, funded by the Foundation for Research, Science and Technology (see Meares et al, 2009).

Scope of this report

This report summarises and reviews all of the research conducted over the last 5 years as described above. Since all the studies are readily downloadable from websites, we have not summarised or discussed each study in depth. Instead, we have taken a comparative approach to identify the salient findings and the important assumptions underlying the analyses highlighted.

The report focuses on the impacts of immigration on the host country, New Zealand. It does not discuss research on the impact on the source countries. There is an emerging literature on the impacts of migration from other parts of the Pacific to New Zealand on those who remain behind (see, for example, Gibson et al, 2009). The report also does not cover the trans-Tasman migration of New Zealanders (but see Haig, 2010; Poot, 2010; and Stillman and Velamuri, 2010).

Generally, the volume of research, the quality of the data, and the depth of analysis has been impressive. Nonetheless, each set of results provides an impetus for research in new directions. The final section of this report suggests topics regarding the economic impacts of immigration for which further exploration is likely to be particularly fruitful.

2 MIGRANT INTEGRATION AND ADJUSTMENT IN THE LABOUR MARKET

Changing composition of the New Zealand population

International migration has a big impact on the population of New Zealand—although more on the composition than size of the population, which is about 4.4 million. As was noted in the introduction about one-quarter of the population is foreign born. This is a much greater proportion than it was when now-retired people were young adults.

For much of the period between 1945 and 1976, the share of the foreign born in the New Zealand population remained within the range of 14–16 percent, implying that the immigrant population and the New Zealand-born population grew at roughly the same rate. However, since the 1980s, the immigrant population has been growing much faster than the New Zealand-born population.

Over the 25 years since 1981, the New Zealand-born population grew just 15 percent while the foreign-born population more than doubled. By 2006, the foreign-born population accounted for 23 percent of the population and close to one-half of these migrants had been in New Zealand less than 10 years. More than half of the foreign-born residents of New Zealand in 2006 lived in the Auckland region.

New Zealand is unique in that in recent years it has had both the highest immigration rate *and* the highest emigration rate among the developed countries (Bedford and Poot, 2010). In general, for every 10 New Zealanders leaving 15 immigrants replaced them. Because this process represents a substitution pattern more than simple addition, the contribution of immigration to net total population growth has been minor: since 1979, about three-quarters of population growth has been due to natural increase and one-quarter due to net migration.

Labour force participation

Because most immigrants are of working age (16–65 years), the labour force participation of the immigrant population is usually greater than that of the New Zealand-born population.

In a descriptive analysis of data from the 1981, 1996, 2001, and 2006 censuses, Nana and Sanderson (2008) found that, in 2006, 25 percent of the working-age population were born overseas, up from 22 percent in 2001, and 18 percent in 1981. Between 2001 and 2006, the working-age population grew by around 271,000 people, about 60 percent of whom were born overseas. Furthermore, the high-participation working-age group—those aged 30–49—had a net inflow of 64,200 migrants and a net outflow of 1,200 New Zealand born.

Out-migration

Not all immigrants stay permanently. In fact, about one-quarter to one-third of immigrants are likely to migrate again, either back to their home country or onward to another destination, such as Australia. Such re-migration is less likely when economic conditions in New Zealand are buoyant. Nana and Sanderson (2008) found that retention of migrants improved over the economically buoyant years 2001–2006 compared with 1996–2001. For every 100 migrants

entering New Zealand in 2001–2006, 24 migrants left; the corresponding figure for 1996–2001 was 42.

The highest rates of out-migration are for those from countries with mainly English-speaking populations. This group is likely to be fluent in English and have fewer constraints to global mobility. The prolonged period of economic growth in New Zealand between 2001 and 2006, and changes in immigration policy that aimed to improve matching migrants and employment through an emphasis on addressing skill shortages, are likely factors contributing to the improvement in migrant retention rates. Additionally, many migrants included as recent migrants in the census would be on temporary visas and not intending to stay on a permanent basis. Because temporary migration has been growing more rapidly than permanent and long-term migration,¹² the re-migration of the latter type of migrants would have been less than 24 out of 100 between 2001 and 2006.

Labour market integration

Stillman and Maré (2009a) examined the path of economic performance of immigrants in New Zealand; specifically, how employment rates, hourly wages, and annual income for immigrants compared with those of similar New Zealand-born people and the extent that this changed with years in New Zealand.¹³ The time pattern of this process, which is referred to in the literature as 'economic assimilation', 'adaptation', or 'integration' in the labour market, was estimated for immigrants from different birth regions and with different qualifications. Unit record data from the 1997–2007 New Zealand Income Survey were used.

As well as providing a descriptive analysis, Stillman and Maré (2009a) estimated regression models of the relationship between labour market outcomes of individuals and their migration status (that is, whether a person is an immigrant and, if so, how long they have been in New Zealand). The regression models also controlled for other characteristics that can affect labour market outcomes. Some researchers assume that outcomes for immigrants change in a simple linear or quadratic way with years spent in New Zealand. However, Stillman and Maré (2009a) let the data determine the shape of the graph that shows how labour market outcomes evolve as experience in the host country is acquired. They used five models, and progressively added additional variables to control for individual characteristics. The three outcomes (employment rates, log hourly wages, and log annual income) were analysed with each of the five models. Furthermore, regressions were run separately for males and females to see whether labour market outcomes differed between male and female immigrants in some fundamental way.

The preferred specification included controls for human capital, partnership, family type, urban location, geographic location, arrival cohort, whether the migrant arrived before the age of 18, and region of origin.¹⁴ This specification showed that newly arriving immigrants experienced, on average, employment rates 20 percentage points below the comparable employment rates of

¹² The trends can be seen in Department of Labour (2009a, section 4).

¹³ This study was conducted as part of the Department of Labour's EII research programme. Stillman and Maré (2009b) provide highlights of Stillman and Maré (2009a).

¹⁴ Human capital was defined as age, $\text{age}^2/100$, and included an indicator for highest qualification (six levels, including foreign school qualification). Geographic location in New Zealand was defined by 12 regions. Arrivals were grouped into those arriving before 1958, 1958–67, 1967–78, 1978–87, 1988–97, and 1998–2007. Region of origin was defined as Australia, the United Kingdom, Asia, the Pacific Islands, and elsewhere.

New Zealand-born individuals, and annual incomes of the new immigrants were \$10,000 to \$15,000 less. For immigrants who gained employment, occupational rank was 5–8 percent lower and hourly wages were 10–15 percent lower than for comparable New Zealand-born workers.

However, during the first 10–15 years in New Zealand, relative outcomes generally improve quite rapidly. The results show that after 15 years, compared with similar New Zealanders:

- employment rates for immigrants are about the same level (Figure 1)
- the income difference is halved for men and eliminated for women
- wages of immigrant women are within 5 percent of those of comparable New Zealand-born women, but the wage disadvantage for employed immigrant men remains about 10–15 percent lower
- there is overall much stronger evidence of adaptation of employment rates than of wages.

Figure 1 Employment rates of immigrants relative to New Zealand born by years in New Zealand



Note: Dotted lines indicate 95 percent confidence intervals.

Source: Stillman and Maré (2009a).

The finding that employment dominates wages in the pattern of economic adaptation of New Zealand immigrants is similar to results from Australia but different from those from the United States. This may be expected, since New Zealand has labour market institutions that more closely approximate those of Australia than of the United States.

An examination of whether the wage disadvantage experienced by immigrants reflects a low return on qualifications gained outside New Zealand finds some ground. Evidence shows that university-qualified immigrants receive a smaller wage premium for their qualifications than do New Zealand-born university graduates. On the other hand, immigrants with vocational qualifications receive a higher premium for their qualifications.

Overall, the size of these effects is relatively small. Controlling for them does not change the overall pattern of wage disadvantage and convergence with New Zealand-born individuals. However, not all immigrants experience the same adjustment in relative labour market outcomes over time, and notable findings are as follows.

- The pattern of entry disadvantage followed by subsequent improvement is particularly pronounced for immigrants from the Asian region.¹⁵
- Immigrants from the Pacific region have relatively poor outcomes on arrival, with no improvement as they spend more years in New Zealand.
- University-qualified immigrants recover their entry disadvantage relatively quickly, within around 10 years.
- Immigrant men without qualifications exhibit much slower improvement, taking around 20 years to recover their entry disadvantage.
- Immigrants who arrive before they turn 18 years of age have outcomes that are indistinguishable from those of comparable New Zealand-born individuals.
- Employment rates are much better for the most recent male cohorts (1998–2007) than for other arrival cohorts.
- Wages are slightly worse for recent entry cohorts (1988–97 and 1998–2007), although once country of origin is controlled for this finding loses statistical significance.

When graphs are drawn for changes in hourly wages or annual incomes with increasing years in New Zealand, such outcomes change in a way similar to Figure 1: a 'catching up' within the first 10–15 years, and no clear trend after that. However, these results do not suggest that further improvements in relative outcomes are impossible once migrants have spent at least 15 years in New Zealand. Many of the migrants in the surveys used by Stillman and Maré (2009a) arrived during or since the mid 1990s. Their characteristics include being relatively young, skilled, and originating from a wide range of countries, reflecting post-1990 immigration policies. However, those in the sample who had been in New Zealand 20 years or more represent a mixed group—some may have been among waves of post-war migration, while others may have arrived in the late 1980s. This heterogeneity of the immigrants who have lived in New Zealand for many years makes it harder to draw conclusions from fluctuations in the graph on the right-hand side of Figure 1.

In general, it can be concluded from Nana and Sanderson (2008) and Stillman and Maré (2009a) that once migrants have been in New Zealand for 1–2 decades or longer, their labour market outcomes are predominantly determined by the same success factors, such as education and experience, as those for the New Zealand born.

Occupation level

Stillman and Maré (2009a) also investigated the occupation level of immigrants' occupations after their arrival. The highest-level occupations can be defined as those that require the highest skills or those that pay the most. Using ranking based on the latter definition, the results show that immigrants start out with lower occupational ranks (about 5–8 percent lower) but that occupational upgrading does occur as part of their adaptation to the New Zealand labour market, again over 10–15 years.

¹⁵ This is also true, to a lesser extent for those from the non-classified regions, consisting of Europe (excluding the United Kingdom), Africa, and the Middle East (mainly South Africa), and the Americas (mainly the United States and Canada).

Education level

An alternative way of looking at immigrants' occupations is to consider the typical level of education that New Zealanders have in any specific occupation and then check whether immigrants in this occupation have fewer or more years of education. This is what Poot and Stillman (2010) did with 1996, 2001, and 2006 micro-level census data.

Poot and Stillman (2010) found that migrants living in New Zealand for less than 5 years were, on average, overeducated. By contrast, earlier migrants tended to be undereducated. However, after accounting for a range of migrant characteristics, including their broad level of qualifications, both overeducated and undereducated migrants became, with increasing years of residence in New Zealand, more like the comparable New Zealand-born population. Convergence from overeducation was stronger than from undereducation.

Initial settlement location and future geographic mobility

The successful integration of immigrants in the host country labour market may involve their gaining experience and getting jobs that make better use of their skills, but it could also involve their moving to another region to find a better job. Therefore, it is interesting to investigate the pattern of migrants' initial settlement and how this location may affect their future geographic mobility.

Migrants may settle initially where there are the best labour market opportunities. Alternatively, migrants may settle where they already know people, that is, they may be attracted by established migrant networks. If migrants put more weight on settling in areas with established migrant networks rather than in areas with stronger-than-average local labour markets this may explain some of the initial disadvantage that Stillman and Maré (2009a) found.

Maré et al (2007) used data from the 1996 and 2001 censuses to examine this question.¹⁶ They used a McFadden's choice model in which each migrant's choice to locate in one of 58 labour market areas (LMAs) is based on the characteristics of that local area.¹⁷ The choices of recent migrants (in New Zealand for less than 5 years) and earlier migrants (in New Zealand for 5 and up to 10 years) are tested. Three specifications are used. The explanatory variables included in all specifications are the:

- proportion of migrants from an individual's region of birth in each LMA 5 years ago
- proportion of each LMA's population that was foreign born 5 years ago
- employment rate in each LMA 5 years ago
- log mean income of full-time wage and salary workers in each LMA 5 years ago

¹⁶ This study was conducted as part of the Department of Labour's EII research programme and also received funding from Marsden Fund grant 05-MEP-002 – The impact of immigration on the labour market opportunities of New Zealanders.

¹⁷ '[LMAs] are created using travel-to-work data at area unit level drawn from the 1991 census. Two sets of labour market areas are defined – one with 140 areas and one with 58. The main differences are that the 140-area set provides greater disaggregation of some relatively small areas. The 140 LMAs are defined by enforcing a minimum employed population of 2,000 and 75% self-containment of workers (allowing for some trade-off between the two). These LMAs have an average size of approximately 1900 square kilometres. In main urban areas, LMAs generally encompass the urban area and an extensive catchment area. In rural areas, LMAs tend to consist of numerous small areas, each centred on a minor service centre' (Maré and Stillman, 2009, p 8, fn 6).

- log mean house price in each LMA 5 years ago
- log population of each LMA 5 years ago.

The model also took into account that LMAs differ in other ways that are unobserved but permanent.¹⁸

The definition of the population group used to define the explanatory variables changes across the three specifications (Maré et al, 2007, p 182). In the first specification, all explanatory variables besides the first measure of migrant networks are defined as being specific to each LMA. The second specification defines labour market characteristics as specific to individuals from particular birth regions in that LMA 5 years ago. This tests whether migrants are attracted to areas where earlier migrants from their particular region are doing better than average, rather than to areas with better-than-average labour markets. In the third specification, all covariates besides local house prices are defined as being specific to an individual's skill group. Skill groups are defined by means of a human capital approach similar to that of Borjas (2003). Considering all possible combinations of five age categories¹⁹ and five qualification groups,²⁰ 25 skill groups are generated.

Overall, the results show that recent migrants are more likely to settle in areas where a larger proportion of previous migrant populations from their region of origin have settled. Migrant networks are, therefore, an important determinant of initial settlement. Earlier migrants (in New Zealand 5–10 years) are also likely to be resident in these areas, but to a lesser extent.

Surprisingly, no evidence was found that recent migrants choose to settle in areas with better-than-average labour market outcomes.²¹ However, there is some evidence that earlier migrants are more likely to have *relocated* to areas with better-than-average labour market outcomes for the overall population. This suggests that labour market conditions become a more important determinant of settlement location in the longer term. However, migrant networks remain the dominant factor even over time.²²

Even though economic factors may be relatively less important than networks, lifestyle factors, and so on, there are specific cases where economic pull factors are an important driver of immigrants' choice of location. Such cases include the Recognised Seasonal Employer scheme, which assists employers in the horticultural and viticulture industries to recruit sufficient seasonal workers at harvest time. In the 2008/09 season, 2,930 workers were recruited from five Pacific states. In the following season, the number grew to 5,207 (EvaluateResearch, 2010). The scheme leads to seasonal migration to non-metropolitan areas, but such flows will not be captured in an analysis of the location choices of permanent residents. The latter are, however, attracted to certain non-metropolitan regions, such as Southland, by the recruitment policies of

¹⁸ This is referred to in the literature as a 'fixed effects' model.

¹⁹ The five age categories are 30–34 years, 35–39 years, 40–44 years, 45–49 years, and 50–54 years.

²⁰ The five qualification groups are none, school, post-school, degree qualifications, and missing.

²¹ It does not matter whether these better outcomes are defined as better-than-average employment levels for the general population, or for previous migrants from the same region, or for individuals of the same skill level. The same results were found when testing the decision to settle in Auckland, Wellington, Christchurch and elsewhere.

²² The relative unimportance of economic conditions may be due to the heterogeneity among the LMAs. We know that by far the majority of migrants settle initially in the main cities with international airports (Auckland, Wellington, and Christchurch). Perhaps the choice among these, and these vis-à-vis the Rest of the LMAs, is driven by both relative economic opportunities and migrant networks. Then, conditional on deciding not to settle in the main metropolitan areas, population and migrant networks may affect the choice among secondary LMAs more so than economic variables.

the territorial authorities (see Spoonley and Bedford (2008) for a review of location-specific immigration policies).

Maré et al (2007) studied only migrants who stayed in New Zealand. That is, the models do not tell us anything about those who leave the country. If migrants who leave the country are not a random sample of the migrant population, the results for recent and earlier migrants may not be directly comparable. Maré et al found that when the cohort of recent migrants in the 1996 census was observed in the 2001 census (after some attrition), by which time they had become earlier migrants, the percentage with no formal qualifications had fallen from 15 percent to 8 percent. Additionally, the proportion with degree qualifications had fallen from 44 percent to 34 percent. Thus, re-migration appears to be relatively more common among those with the lowest and those with the highest qualifications.

The statistical analyses of the integration of immigrants reviewed above are all based on comparing outcomes for possibly different groups of immigrants. They are not based on a longitudinal analysis in which the same people are observed over a number of years.

The Longitudinal Immigration Survey: New Zealand (LisNZ) has provided the first data on individuals who are tracked over their first 3 years in New Zealand. The same group of migrants was interviewed at 6 months (wave 1), 18 months (wave 2) and 36 months (wave 3) after taking up residence in New Zealand between November 2004 and October 2005 (see Department of Labour, 2009b). About 7,000 people have been interviewed²³ and the data provide a wealth of information on migrants' settlement experiences and outcomes.

The LisNZ results reinforce the earlier conclusion that economic factors may be less important than other factors in determining where migrants settle. Many migrants choose New Zealand for its lifestyle, its environment, and their children's future. Even before gaining residency, they are already linked with New Zealand through personal contacts. English language skills are an important factor in economic integration.

LisNZ can provide some information on the extent to which there is re-migration of immigrants by measuring the extent of attrition between waves 1 and 2 (it is at least plausible that those who could not be interviewed in wave 2 are living abroad). Bryant and Krsinich (2009) analysed whether the 14 percent of LisNZ respondents interviewed in wave 1 who could not be re-interviewed in wave 2 differed from the other respondents. They found that respondents who were employed, very satisfied with life in New Zealand, or owned a house were less likely to attrite. Consistent with Maré et al (2007), there is also evidence that those on higher incomes are somewhat more likely to re-migrate than others.

Wealth

There are also other indicators of the economic integration of immigrants besides earnings, (un)employment rates, and the extent to which there is a good match between migrants' jobs and the skills they have. One less commonly studied indicator of immigrant economic outcomes is wealth.

Gibson et al (2007) examined wealth differences between immigrants and the New Zealand born by means of data from the 2001 Household Savings Survey. Compared with other migrant integration studies, the savings survey has the advantage of a focus on households rather than

²³ At wave 1.

individuals. Household size and composition can be an important issue for migrant wellbeing. Because a lot of New Zealanders' wealth is tied up in their homes when they are home owners, housing wealth and other forms of wealth are considered separately.

As in labour market integration work, Gibson et al (2007) considered a variety of factors that influence outcomes. Therefore, they were able to assess whether differences between migrants and the New Zealand born were due to the former group's years in New Zealand or other factors. The novelty of their research is that they were also able to analyse differences across the entire distribution of wealth and not just for 'modal' migrant and New Zealand households.

Gibson et al (2007) found that after controlling for age, education, inheritance, and income, there was little difference in wealth between single migrants or mixed nativity couples with New Zealand-born singles or couples respectively. However, migrant couples appeared to have less wealth on average, and this difference could be only partially explained by the aforementioned factors.

Reasons for migrating

Lifestyle is the main motivator of migration

Economic outcomes of immigrants are also being investigated in the Integration of Immigrants Programme (IIP), which the Foundation for Research Science and Technology funds (see Meares et al, 2009). Much of this research is still work in progress.²⁴ A unique aspect of the research is that it combines quantitative and qualitative modes of investigation. Five migrant groups are the focus of the IIP: the Chinese, Koreans, Indians, South Africans, and the British. Surveys with employers and employees from these five groups have been undertaken in Auckland and Hamilton, and reports for each birthplace group are being written.

Meares et al (2010) interviewed 20 recent migrant employers and 20 employees from China, selected from the accommodation and food and retail industries in Auckland. Between 2001 and 2006, the number of migrants from China doubled to 53,694 and migrants from China are about 55 percent of the ethnic Chinese population in New Zealand. The findings of this in-depth qualitative survey of Chinese migrant employers and employees reinforce those of the large sample surveys and census data reviewed earlier in this section. Lifestyle is the main motivator of migration.

The outcomes in the first few years after migration suggest that the goal of a better lifestyle was not achieved: regular work hours and full social lives in China were replaced with hard work, long hours, and quiet social lives in New Zealand. Nonetheless, most interviewed migrants expected to remain in Auckland and more than half expected to retire in New Zealand. The research also identified residential concentrations of Chinese migrants and a concentration of business activity. The latter is sometimes referred to as an 'ethnic precinct' (see, for example, Collins, 2003), which can be found for some other ethnic groups as well.

²⁴ Outputs from the IIP are on the IIP's website, <http://integrationofimmigrants.massey.ac.nz>

Better economic outcomes for children

LisNZ data and overseas survey data on migrants' reasons to migrate indicate that a desire to obtain a better life for one's children is often a more important factor than one's own outcomes (see also, for example, OECD, 2010).

To assess the economic outcomes of children of migrants, the utilised data set must contain information on whether the respondents' parents were born abroad. In Australia this information is available from the population census, but in New Zealand the information has not been collected that way. Instead, a recent survey, the General Social Survey, did collect information on the birthplace of parents. Woolf (2010) used these data to compare the outcomes of children who had one parent or both parents born overseas with the outcomes for children who had both parents born in New Zealand. Interestingly, Woolf found—using logistic regression—that children with one parent born overseas do worse than comparable those with two New Zealand born parents, but children with two migrant parents do better. It is not possible with the available data to determine whether these results vary across different countries of birth.

Differences between New Zealand-born and Overseas-born

An important, but difficult to address, issue is to explain differences in outcomes between immigrants and the native born after taking into account in a multivariate analysis all possible observed factors that could play a role. Essentially, the question is why migrants might continue to earn on average a different amount than a group of native-born people who are observationally identical. One possibility for the differences in outcomes between immigrants and the native born is that the model being used is mis-specified: some individual characteristic that affects earnings has been overlooked and if this factor could be taken into account, the difference would vanish. [Self-selection and discrimination may also driving these results.](#)

Differences that cannot be directly observed

Another possibility for the differences in outcomes between immigrants and the native born is that migrants differ from the native born in ways that cannot be directly observed, such as being more flexible, energetic, and willing to take risks. Such 'positive' factors would lead to migrant outcomes being better than those of the comparable native born. For example, Poot and Stillman (2010) found that many older migrants end up in occupations for which they are underqualified, but presumably they function effectively because of personal attributes.

Self-selection

Migrants may self-select among the population of the sending country in terms of an unobserved ability to do well in a host country. Therefore, the difference in average earnings of migrants in the host country compared with the average earnings of those who are left behind but who are observationally the same (in terms of age, skills and so on) is likely to overestimate the gains from migration of a randomly selected individual.

Because economics is not an experimental science, it is not easy to take self-selection into account. However, sometimes government policies generate a so-called 'natural experiment'.²⁵

²⁵ See McKenzie and Yang (2010) for a review of experimental approaches in migration studies.

McKenzie et al (2010) exploit the fact that Tongans who wish to migrate to New Zealand are selected by means of a random ballot. A good way to show how self-selection increases the estimated gain from migration is to compare the incomes of those whose names were drawn and then migrated with the incomes of those who did not apply and with those who applied but were not selected. Not accounting for positive selection on unobservables can overstate the gains from migration from Tonga to New Zealand by up to 30 percent. The same methodology gave Stillman et al (2009) the means to discover that migration from Tonga to New Zealand had a positive impact on mental health, particularly for women and those with poor mental health before migration.

Discrimination

If certain migrant groups even in the long run do not catch up to comparable New Zealand-born workers, the question arises to what extent immigrants might be discriminated against in the labour market.

LisNZ interviews from wave 1 (6 months after being granted permanent residency), almost one-quarter of migrants reported that they had experienced at least one incident in which they felt discriminated against (Department of Labour, 2009b, p 142).

Experiences of discrimination varied across region of origin. Migrants from Asian countries were more likely to report having experienced discrimination than migrants from other regions. This finding is reinforced by the results of a field experiment in which recruitment agencies were sent unsolicited resumes from two fictitious people: one native-born person of European descent and one Chinese immigrant (Ward and Masgoret, 2007). Both were assumed to seek employment in the technology sector. In total, 42 resumes were sent for each. The immigrant resume was less likely to trigger a request for further information and more likely to have contact terminated than the native-born resume. The difference was statistically significant.

3 LABOUR MARKET IMPACTS

One-quarter of the 2006 working-age population was overseas born, and almost two-thirds of the growth in the workforce between 2001 and 2006 was from migration (Nana and Sanderson, 2008). Therefore, an important issue in New Zealand is the impact of the inflow of migrants on the labour market outcomes of the New Zealand born and earlier immigrants.

Various impacts can be considered, for example, on wages, employment, labour force participation, and unemployment.²⁶ A huge international literature has emerged on this topic in recent years, but the New Zealand econometric evidence is limited to in-depth and careful analysis of wage and employment effects by Maré and Stillman (2009) and an assessment of whether an immigrant influx triggers outward migration of the local population by Stillman and Maré (2007). These two studies are summarised in turn.

Impacts on New Zealand-born and overseas-born

Maré and Stillman (2009) used data from the 1996, 2001, and 2006 census to investigate wage and employment effects of immigration.²⁷

A problem with census data is that the wage or salary earned in the labour market is not observed in the census data: respondents report only their gross annual income from all sources. Because the New Zealand Income Survey does report both wages and annual gross incomes, it is possible to develop a model that predicts quite accurately what a person's wage would be, given the annual income they reported and a range of other personal characteristics. This model was used to impute the wages of New Zealand-born and immigrant census respondents.²⁸

This research estimated the impact of inflows of 'recent' migrants (in New Zealand for up to 5 years) on the wages and employment of 'earlier' migrants (in New Zealand for 5 years or longer), on the New Zealand born, and on other recent migrants. Effects were estimated within and across skill levels and at several different levels of geographic area.

Skills were defined in several ways. First, a human capital approach similar to that in Maré et al (2007) created 24 age-qualification skill groups made up from six age categories²⁹ and four qualification groups.³⁰ The second approach used five skill groups defined as each individual's probability of working in the following five broad occupation groups: legislators, administrators, and managers; professionals; technicians, associate professionals, clerks, and trades workers; agriculture, fishery, and forestry workers; and service and sales workers, plant and machine operators, and elementary occupations.

²⁶ A meta-analysis of the international literature on the four listed impacts is in Longhi et al (2008).

²⁷ This study was conducted as part of the Department of Labour's EII research programme and also received funding from Marsden Fund grant 05-MEP-002 – The impact of immigration on the labour market opportunities of New Zealanders.

²⁸ Borjas and Friedberg (2009) highlighted the importance of including information on nativity in the imputation of wage and income data. Maré and Stillman (2009) include a quadratic of years in New Zealand and an indicator for if the migrant was born in Australia, the United Kingdom, Asia, the Pacific Islands, or elsewhere.

²⁹ The age categories were 25–29 years, 30–34 years, 35–39 years, 40–44 years, 45–49 years, and 50–54 years.

³⁰ The qualification groups were none, school, post-school, and degree qualifications.

In this research, the effects of immigration on labour market outcomes could be calculated because immigrants, as noted earlier, disproportionately settle in particular regions. It was then possible to run a regression model in which the labour market outcome for a particular group was explained by the proportion of recent migrants in a group of workers. The group was defined by skills, location, and time period. Irrespective of the presence of migrants, labour markets may be different for different skill groups, locations, and time periods and this was taken into account in the regression model.³¹ Different geographic areas were used: 58–140 LMAs, 75 territorial authorities, and 16 regional councils. The largest number of observations for the model was of course obtained when 140 LMAs were used.

The results of these regressions, which Maré and Stillman (2009) call ‘descriptive evidence’ or ‘reduced-form regressions’, suggested that a 10 percent increase in the recent migrant share was associated with 0.14 and 0.36 percentage points *lower* employment rates for the New Zealand born and recent migrants, respectively, and with 0.89 percent *higher* wages for the New Zealand born. The lower employment rates do not necessarily mean that immigration generates unemployment. Instead, some workers may move out of the labour market (for training, retirement, caring for children, and so on). The higher wages suggest that the recent immigrants are *complements* to the New Zealand-born workers rather than *substitutes*. The question then naturally arises whether some kinds of immigrant are more likely to be complements to particular types of local worker. Such questions can be answered only when a particular production technology is assumed for the various industries in the labour market.

Maré and Stillman (2009), therefore, explicitly assumed three different production structures that allowed the nature of competition and substitutability between migrant and non-migrant workers to differ.³² They used these production functions to investigate how readily recent immigrants, earlier immigrants, and New Zealand-born workers compete for the same jobs, both within and across local skill groups. The results are sensitive to the theoretical production structure that is imposed. However, regardless of the model being estimated, Maré and Stillman (2009) found little evidence that immigrants negatively affect either the wages or employment opportunities of the average New Zealand-born worker.

The findings were highlighted by simulating the impacts of four changes to immigration flows by changing the size of the inflow (halving and doubling) and changing the composition (more high skilled and more low skilled). The largest impact that recent migrants had was on the wages and employment of other recent migrants. For example, *doubling* the inflow of recent migrants to an area would decrease wages of recent migrants by 4–14 percent and lower employment rates 10–13 percent.³³ Estimates showed a much larger negative wage impact on recent migrants of close to 60 percent.³⁴

³¹ Two-way interactions between skills, location, and time are the additional explanatory variables in the regression model.

³² Two are based on a so-called constant elasticity of substitution (CES) production function and the third on a generalised Leontief (GL) production function. In the first CES function, nativity groups (the New Zealand born, recent immigrants, and earlier immigrants) are assumed to be perfect substitutes within skill groups. In the second CES function, they are assumed to be imperfect substitutes within skill groups. In the GL function, they are also assumed to be imperfect substitutes.

³³ See footnote 32.

³⁴ See footnote 32.

The impact on New Zealand-born workers of doubling recent migrant inflows was found to be positive, but modest, raising employment rates 1.4–1.8 percent and wage rates 0.2–1.9 percent, depending on the model assumptions.

Some evidence suggests that migrants compete most with New Zealanders with the *same* skill level, but the impact is marginal. The only evidence found of negative impacts of recent migrants on wages for New Zealand-born workers was when relative skill composition of the recent migrant inflows was increased; this had a small negative impact on the wages of high-skilled New Zealand-born workers. However, this was more than offset by a positive impact on the wages of medium-skilled New Zealand-born workers.

One reason migrants may have a minimal effect on the wages of New Zealanders (even those with similar skill levels) is that they replace New Zealanders who are moving elsewhere in New Zealand or abroad. The international literature suggests that wage impacts are greater over larger geographic areas than tightly defined locations, implying that the impacts of immigration are not only local (see, for example, Longhi et al 2005). However, the evidence in Maré and Stillman (2009) on differences in impacts across different sizes of geographical areas was varied and unlikely to be statistically significant.

Outward migration of local population?

It was noted earlier that in New Zealand immigrants substitute to some extent for the native born who move abroad. This begs the question whether, at the local level, an increase in immigration induces the local population to seek work in other regions. International evidence conflicts on this. Borjas (2006) argues that immigrant inflows in United States cities encourage the outward migration of natives, while earlier Card (2001) concluded that foreign-born arrivals and native-born migrants were attracted to the same cities.

In New Zealand, Stillman and Maré (2007) specifically examined how the supply of recent migrants in areas affects the geographic location of the similarly skilled New Zealand born and earlier migrants. They used data from the 1996 and 2001 censuses. They used a geographical areas-based approach to take advantage of the fact immigration is spatially concentrated, so differences in the local supply of migrants across area should have some impact on the labour market outcomes of similarly skilled New Zealand-born and earlier migrants across those areas.

To ensure that the results were robust, different aggregations of local areas and two definitions of skill groups were used. The sizes of local areas varied: 58–140 LMAs and 16 regional councils. There were two approaches to skill group. The first approach was similar to the approach in Maré and Stillman (2009): 30 age-qualification groups made up from six age groups³⁵ and five qualification groups.³⁶ The second approach used four skill groups defined as each individual's probability of working in broad occupation groups similar those described in Maré and Stillman (2009).³⁷

The regression model controlled for observable differences in LMAs, skill groups, and time periods. It also controlled for unobservable fixed differences in local labour markets, skills groups, and time periods; unobservable time-varying differences in local labour markets and

³⁵ The age categories were 25–29 years, 30–34 years, 35–39 years, 40–44 years, 45–49 years, and 50–54 years.

³⁶ The qualification groups were missing, none, school, post-school, and degree qualifications.

³⁷ Unlike in Maré and Stillman (2009), Professionals were added to the Legislators, Administrators, Managers group.

skills groups; and unobservable spatially varying differences in skill groups. The model also used a so-called 'instrumental variables' approach to isolate a pull-factor effect that is potentially independent from skill-group-specific local demand shocks.

Discussion

Overall, the results provide little support for the hypothesis that migrant inflows displace either the New Zealand born or earlier migrants with similar skills in the areas in which migrants are settling. If anything, the results indicate the existence of positive spillovers between recent migrants and other individuals. These encourage individuals to move to, or remain in, the areas in which similarly skilled migrants are settling. This is a similar conclusion to the one by Card (2001) with the United States data. Therefore, it appears unlikely that internal mobility moderates any potential impacts of immigration on the labour market outcomes of the New Zealand born and earlier migrants found in Maré and Stillman (2009).

One aspect that this model was unable to test was the displacement out of the country of New Zealand born. For example, it could be that when the proportion of new migrants settling into a specific region is increasing, the rate of permanent and long-term departures from that region could be increasing as well. This hypothesis has not been tested.³⁸

In general, the New Zealand evidence that immigrants have no negative impact on the labour market outcomes of the native born population is highly consistent with the broad range of international evidence (see, for example, Longhi et al 2010a, 2010b).

Several reasons for this benign impact have been suggested, but the relative importance of these remains unclear. There is general agreement that the demand for labour curve is downward sloping so that, all else being equal, a labour supply shock would lower the wage.³⁹ However, in practice an increase in immigration triggers a range of effects both in the short run and the long run that may offset the negative impact of a positive labour supply shock.

One plausible explanation is the increase in local demand that immigrants generate from the day of arrival. In section 1 we noted that historically New Zealand economists expected immigration to have excess demand effects: new immigrants could contribute more to the demand for goods and services than their presence could fill vacancies in the labour market. In such a situation, there would certainly be an inflow of capital to permit firms to produce more goods and services to meet the greater level of local demand. Such an influx of capital would offset any downward effect on wages. Bodvarsson and Van den Berg (2009) considered the additional demand an important but rather overlooked explanation for small wage effects from immigration.

³⁸ Quarterly data on permanent and long-term arrivals and departures to and from 92 areas in New Zealand are available from 1992 onwards. However, the area may not reflect the usual residence of the respondents.

³⁹ Borjas (2003) argues that a 10 percent increase in immigrants lowers the wages of workers who are directly competing with these immigrants by 3–4 percent.

4 HOUSING IMPACTS

Between March 2002 and March 2007 *real* house prices increased almost 80 percent, a similar magnitude to the growth experienced over the entire period between 1962 and 2002 (DPMC House Prices Unit, 2008). Interestingly, the increases in house prices occurred across all regions and classes of dwelling. This is different from the last boom in the mid 1990s that was predominantly based in Auckland.

In 2007, concern about the increase in house prices and a need to understand its causes and possible interventions prompted the Government to create a special unit on house prices in the Department of the Prime Minister and Cabinet. The unit concluded that population growth, household formation, historically low interest rates, the increasing availability of credit, expectations of future price appreciation, and the tax structure had all boosted housing demand (DPMC House Prices Unit, 2008). Much of the research on the links between migration and house prices that is discussed in this chapter informed the unit's work'.

Housing tenure and demand

Sanderson et al (2008) conducted a descriptive analysis of census data between 1991 and 2006 and found that the number of new households being created between censuses had been relatively stable (ranging from 80,000 between 1996 and 2001 to 109,000 between 2001 and 2006).⁴⁰ Of the increase of 109,000 households between 2001 and 2006, around 42,000 were migrant couple households, 21,000 were mixed New Zealand-born/migrant couples, 36,000 were New Zealand-born couples, and 3,500 were single migrants. In contrast, the number of New Zealand-born single-person households decreased by 40,000.⁴¹

Home-ownership rates were found to be linked more to the partnership status of a household than to place of birth (see Table 1). In other words, couples from various birthplaces have more in common with couples generally than with single households from the same birthplace. In general, the housing behaviour of migrants who have been in New Zealand for more than 15 years becomes similar to that of New Zealand-born residents.

⁴⁰ This study was conducted as part of the Department of Labour's EII research programme.

⁴¹ The decline in the number of New Zealand-born single-person households is surprising and against the long-term trend, both in New Zealand and elsewhere. Between 2001 and 2006, the number of 'not elsewhere included' households nearly doubled from 54,000 to 101,000. It is possible that this accounts for some of the decline in single-person households. The number of single-person households generated through death of a partner could have been smaller over this period than the number of single people partnering, but net emigration of New Zealand-born single-person households is more likely.

Table 1 Tenure and dwelling type ratios for selected household types, 2006

Household type	Own home (%)	Private rental (%)	House (%)	Single-storey flat (%)
NZ-born couple	77.1	22.0	90.6	4.5
NZ-born/migrant couple	77.0	20.2	87.3	5.4
Migrant couple	62.4	27.3	78.0	10.5
Migrant couple, in NZ more than 15 years	77.0	13.3	86.2	6.7
NZ-born single	51.5	34.1	69.7	16.8
Migrant single	48.9	32.9	61.3	18.8
Migrant single, in NZ more than 15 years	59.6	24.5	65.9	19.5

Source: Sanderson et al (2008).

Scenario analysis showed that migration flows would act to change the nature of housing demand. Under both 'conservative' migration and 'growth' migration scenarios, by 2016:

- rentals from private landlords would form the largest tenure type of the increase in households (around 50 percent of the new households)
- houses would remain the largest dwelling-type category, followed by flats or apartments
- single-migrant households would drive the growth in demand for flats and apartments
- most Aucklanders would continue to live in houses, but the rate of growth would slow relative to the number of households living in flats or apartments.

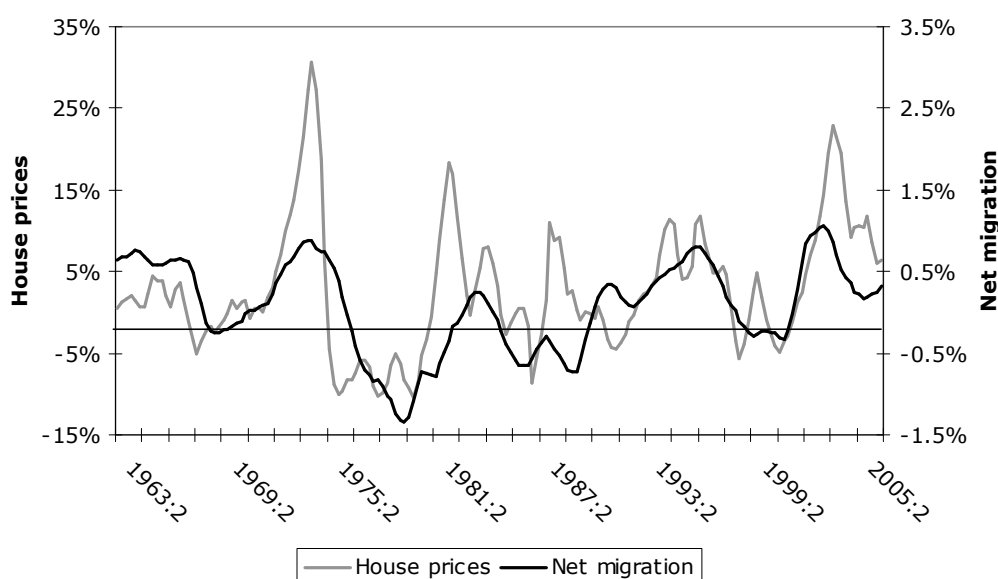
Assuming the increase in households translates into a supply of new dwellings, demand is not expected to exceed supply. However, the type of dwelling built may need to be adjusted to reflect the changing demand patterns.

Migration and house prices at the national level

Coleman and Langdon-Lane (2007) conducted a time series macroeconomic study of the relationship between immigration and house prices. Figure 2 shows the change in annual average house prices and net migration from 1962 to 2006. Net migration rates and real house prices are strongly correlated (the simple correlation coefficient is 0.55 over the 1962–2006 period). If one interpreted this correlation as causation, it suggests a net inward migration rate of 1 percent of the population would be associated with a 7.8 percent increase in real house prices. Of course, the relationship between house prices and immigration could be spurious: both could, for example, increase in a buoyant economy, the former because the productivity of land increases and the latter because the demand for labour increases. There need not be a causal relationship between the two.

To rule out the possibility of spurious causation, Saiz (2003) uses the 'natural experiment' of the 1980 Mariel boat lift in which Fidel Castro suddenly permitted many Cubans to migrate to Miami, causing the Miami population to increase 7 percent almost overnight. Based on the observed increase in rents following this immigration 'shock', Saiz concluded that immigration at a rate of 1 percent of a city's population would increase house prices and rents also by about 1 percent, considerably less, therefore, than what the simple time series correlation in the New Zealand case suggested.

Figure 2 Four-quarter change in house prices and net migration, 1962–2006



Source: Adapted from Coleman and Landon-Lane (2007)

To get a better estimate of the effect of an immigration shock on house prices in the New Zealand case, Coleman and Landon-Lane (2007) used a structural vector autoregressive (VAR) model at the national level for two periods: 1962–1982 and 1991–2006. This kind of model explains quarterly values of a set of macroeconomic variables in terms of the lagged values of all the variables.⁴² The model was estimated separately for the period before 1983 and the period after 1990 because during the years of radical economic reforms (1984–1990) monetary policy was also changed and this would have led to changes in the coefficients of the model during this ‘transition phase’.

Coleman and Langdon-Lane (2007) found with their model that an inflow of migrants that is equivalent to 1 percent of the overall population was associated with house prices increasing 8–12 percent. Again, this is a much larger effect than the overseas evidence suggests.

Although Coleman and Langdon-Lane (2007) found a very strong relationship between net migration and house prices, they were not able to identify the reason for this. The authors suggested three possible reasons. First, it takes time to build new homes so a rapid inflow of migrants combined with supply constraints (including materials, services, and so on) can cause construction prices to increase sharply until enough houses are built for the migrants. The impact could be particularly large if the new migrants had housing preferences different from the preferences of those who vacated existing properties. (Sanderson et al (2008) suggested that this could indeed be the case.) Second, migration flows are likely to be correlated with other factors that cause house prices to increase but that were not adequately controlled for in the study. For example, migration flows may be correlated with future income expectations. If this were true, then the impact of migration would be upwardly biased because it would also be a proxy for locals buying more-expensive homes. Third, a migrant inflow may destabilise expectations about house price appreciation, and if people or households have adaptive expectations this could cause a long period of disequilibrium.

⁴² The five variables in the model are net migration per 1,000 members of the population, the number of housing starts per 1,000 members of the population, the natural logarithm of real house prices, the unemployment rate, and the mortgage interest rate.

Migration and house prices at the regional level

One major deficiency with a national time series analysis is that it does not exploit the fact that migrants are predominantly attracted to metropolitan regions. If migrants affect house prices and/or rents, this should be noted more strongly in the areas where most immigrants settle. However, again the relationship could be spurious if real house prices go up the most in large cities because of agglomeration advantages (that increase the value of land) while these advantages also increase employment opportunities for migrants.

Grimes et al (2007) analysed the dynamics of adjustment in national and regional labour and housing markets using a VAR model on a panel of regions from 1986 to 2006. They sourced labour force data from the Household Labour Force Survey, wage data from the Quarterly Employment Survey, and house price data from Quotable Value New Zealand. Grimes et al found that, at the *national* level, house prices and migration indeed both rose strongly in response to increased employment. For example, a 1 percent positive employment shock led to a long-run level of employment 1.3 percent higher than in the absence of the shock, with migrants filling approximately half of these extra jobs. The 1 percent employment shock causes house prices to be 6 percent higher in the long run.

In contrast, a *region*-specific employment shock results in strong in-migration, but this is not associated with movement in relative house prices. For example, a 1 percent region-specific increase in employment causes the long-run regional share of employment to be 0.5 percent higher, with the adjustment to the employment shock entirely met by migration into the region in the long run. However, this 1 percent region-specific employment shock causes house prices to rise only 0.02 percent.

The authors suggest four possible reasons for the stronger effect at the national level. First, house prices may be largely determined by a national housing market (that is, although house prices are higher in Auckland than in Invercargill, over time they may be growing at similar rates). Second, housing market adjustment may occur in more localised areas than the ones used in the study. Third, volatility present in the data series may mean that the sampling error is obscuring the results. Fourth, it appears that house prices and employment are not moving together in the long run at the regional level.⁴³

Stillman and Maré (2008) investigated the relationship between changes in population size and housing sale prices and rents in local areas.⁴⁴ The authors predominantly focused on *local* rather than national impacts, to avoid the possible confounding influence of macroeconomic factors, and to gain a fuller understanding of the local interaction of migration and housing. This paper used population data from the 1986 to 2006 New Zealand censuses, house sales price data from Quotable Value New Zealand, and rent data from the Department of Building and Housing. Importantly, the authors disaggregated population change into new migrants, New Zealanders returning from abroad, and New Zealanders and earlier migrants moving from other regions within New Zealand. This research was the first of its kind conducted at such a detailed level of analysis in New Zealand.

⁴³ Econometrically speaking, regional employment and house prices did not appear to be cointegrated.

⁴⁴ This study was conducted as part of the Department of Labour's EII research programme and also received funding from Marsden Fund grant 05-MEP-002 – The impact of immigration on the labour market opportunities of New Zealanders.

Using descriptive analyses, Stillman and Maré (2008) found a positive relationship between change in population, immigrants, and house prices at both the national and local levels. The authors also looked at the relationships over each intercensal period and found that results for 2001–2006 were quite different from those for the other periods. Overall, house price appreciation and population growth was higher in 2001–2006 than in any other period, but the areas with the *largest* population increases in 2001–2006 tended to experience *smaller* increases in house prices. These findings do not control for heterogeneity in the different population groups that live in different areas in New Zealand or for the fact that people who change locations may self-select into growth areas where house prices are appreciating. To control for such factors, a more sophisticated multivariate analysis was applied.

The multivariate analysis found that population growth and house prices were only weakly associated during 1991–2006. For example, a 1 percent increase in an area's population was associated with a 0.2–0.5 percent increase in house prices. The impact on rents was found to be even lower.

The source of population growth was then broken down to separate impacts that new migrants, New Zealanders returning from abroad, and movement within New Zealand (including earlier migrants) had on house prices. Although immigration flows were an important contributor to population change, no evidence was found that the inflow of immigrants had an impact on house prices. Local house price increases were more associated with the location that New Zealanders returning from abroad settled in than where new migrants lived. For example, locations with a one percentage point higher inflow rate of returning New Zealanders had 6–9 percent higher house prices and 4 percent higher rents. It is unclear what is driving this association: whether returning New Zealanders are increasing house prices or whether they are moving back to areas that have had higher-than-average price increases.

Discussion

Stillman and Maré (2008), Coleman and Landon-Lane (2007), and Grimes et al (2007) all found a relationship between immigration and house prices at the national level. Interestingly, Stillman and Maré (2008) and Grimes et al (2007), who included sub-national analyses, found much weaker relationships. Further, when the composition of the inflows was disaggregated, the impact of an inflow of overseas born to an area was negligible. Given the lack of a relationship at the local level these results raise doubts about whether the strong positive correlation that exists between migration and house prices at the national level is in fact causal. In other words, given the uneven distribution of immigrants across New Zealand, if immigration were the key driver of recent house price inflation, then it would be expected that areas with higher inflows of immigrants would have the highest levels of house price appreciation. This was not found to be the case and suggests that the relationship at the national level may be a consequence of omitted aggregate time series factors that raise both immigration and house prices.

5 TRADE AND TOURISM IMPACTS

New Zealand interacts with other countries in many different ways: through trade in goods and services (including tourism and education); foreign direct investment; short-term travel; temporary and permanent migration; communication and information; and international agreements and cooperation.

In 2009/10, exports of commodities were valued at \$43 billion (23.0 percent of gross domestic product (GDP); 23 percent of this went to Australia) and imports of commodities were equal to \$46 billion (24.6 percent of GDP; 18 percent came from Australia).⁴⁵

Tourism also contributes significantly to the economy with services related to tourism being the second-biggest export earner behind dairy products. Moreover, the education of foreign students contributed in 2009 more than \$2.2 billion to GDP.⁴⁶

Income from New Zealand investments abroad yielded \$2.4 billion, while foreign investment in New Zealand generated an income of \$13.4 billion to its foreign owners. Altogether, the current account balance on international transactions was in deficit to the tune of 5.9 percent of GDP.

The people flows are similarly important. About 65,000 people left New Zealand in 2009 to live abroad for 12 months or more (equivalent to double the natural increase, births minus deaths, of the New Zealand population that year; half went to live in Australia) while 86,000 people arrived to stay for 12 months or more (equivalent to two and a half times the natural increase; with 17 percent moving from Australia). Overseas visitor arrivals exceeded 2.4 million in 2009, of whom 42 percent live in Australia. Net permanent and long-term migration is positive and about 0.5 percent of the population.

Migration and trade

In recent years, interest has been increasing in how international trade in goods and services, foreign direct investment, and even flows of ideas and knowledge, are all related to migration.⁴⁷ These interrelationships are bi-directional: migration affects other forms of international interaction and vice versa. Strutt et al (2008) extensively overviewed the literature from the New Zealand perspective. They also considered how the interactions between migration and trade might be taken into account in trade negotiations (see also Poot and Strutt, forthcoming).

Strutt et al (2008) note that trade and migration are substitutes in conventional economic theory. If a country wishes to purchase commodities at a lower price than it can produce these domestically, it can either encourage the imports from low-wage countries (by reducing import tariffs) or permit local firms to recruit low-wage workers to reduce production costs domestically. When trade is encouraged, economic growth in the exporting country raises incomes there. This reduces the incentive for workers from such countries to emigrate and when living standards in the two countries have become similar, migration flows cease or become more balanced.

The same can be said about the outsourcing of services, which has experienced rapid growth. Outsourcing of services and immigration are 'two sides of the same story': when a firm cannot

⁴⁵ The quoted statistics are from Statistics New Zealand (2010).

⁴⁶ See Infometrics et al (2008).

⁴⁷ For a recent synthesis and extension of the United States literature, see White (2010).

hire cheaper labour through immigration, outsourcing may be undertaken to substitute for this. In most countries, outsourcing faces fewer restrictions than immigration, and when outsourcing increases, immigration pressures are likely to diminish.

However, it is not always appropriate to view migration as a substitute for trade or outsourcing. The more economies produce knowledge-driven specialised services and a variety of high-value goods, the greater the tendency for economic activity to concentrate in urban agglomerations and the greater chance of divergence between these agglomerations and peripheral areas. Huge literatures have emerged to explain how growth can be reinforced by so-called knowledge externalities and by the concentration of economic activities in large agglomerations.⁴⁸ If immigrants are different from the host country work force (for example, they are either highly skilled or lowly skilled rather than having average skill levels), they could act as complementary labour inputs in production, as was discussed in section 3. This increases the productivity of firms in the domestic economy and raises the incomes of the host population, which in turn attracts more immigrants. The implication of this is that international trade and migration can also be complements, that is, more trade may encourage more immigration.

Technological change and greater information flows between countries may also encourage more migration. Increasing sophistication and use of new information and communication technologies and cheaper real airfares have made long-distance job search more feasible. Likewise, modern communication technologies, including email and the internet, lower the costs that migrants face to keep in touch with their relatives and friends and help them to remain informed about their home country. This increases the proportion of the population that might contemplate migration.

Migration, trade and other interactions

Having established that trade and other forms of international interaction can encourage migration, the opposite is true as well. Migration can foster or create trade in goods and services and other forms of interaction between host and home countries. There are various means by which this can occur.

First, higher global income resulting from migration triggers a greater demand for traded goods and services (Strutt et al, 2008). Secondly, immigrants themselves encourage trade. The two main mechanisms through which this happens are immigrant preferences and a lowering of transaction costs. Significant immigration from a particular country can create demand for goods and services from that country. This is called the 'home bias in preferences' effect. The second mechanism is that transaction costs of trade between the home and host country are lowered since immigrants have detailed knowledge of their home countries' markets, business practices, and laws. Moreover, when the language spoken in the host country differs from that in the home country, bilingual immigrants can facilitate communication. Immigrants may also make use of personal networks in their home and host countries to facilitate trade.

The impact of migrants on trade is likely to become less as migrants become more integrated into the host economy. Their role as trade facilitators for exports to, and imports from, their home country will be most effective if they remain in regular contact and continue to desire goods from their home country. This creates a paradox in that social tensions may reduce by

⁴⁸ These literatures are referred to as the endogenous growth theory and new economic geography literatures respectively. For introductory reviews, see Aghion and Howitt (2009) and Brakman et al (2009), respectively. How these phenomena impact on peripheral countries and regions is extensively discussed in Poot (2004).

rapid integration, including cultural assimilation, but migrants who specialise in trading with their home country benefit from maintaining their cultural identity.

People moving from developing countries often send remittances back to their families and this can indirectly impact on trade. Recent World Bank estimates suggest that remittance flows to developing countries may have reached close to US\$300 billion (OECD, 2009). While the recent global economic downturn led to a sharp decline in remittances (Fix et al, 2009), they continue to allow developing countries to import more than otherwise. On the other hand, if immigrant groups become large, they may start producing home-country products and services in the host country. This could result in a fall in exports from the home country, lower the incomes of the home country population, and partially offset the positive income effect of the remittances (Bryant et al, 2004).

There have been many econometric studies of the effect of immigration on trade, including three studies in New Zealand. The literature provides conclusive evidence that international migration boosts international trade.⁴⁹ However, as in the other areas of immigration impact assessment discussed in the previous sections, the effects are quantitatively small.⁵⁰

Law et al (2009) estimated a so-called gravity model of trade between New Zealand and its trading partners.⁵¹ Effectively this means that they expect trade between New Zealand and another country to be positively related to that country's GDP and inversely related to how distant that country is from New Zealand (with distance acting as a proxy for the freight cost). International migration is taken into account by testing whether trade with a country is positively related to the number of migrants from that country living in New Zealand. The hypothesis that trade is positively related to the number of New Zealand born living in that country, a group referred to as the diaspora, is also tested. Other factors taken into account are the foreign country's population, whether English is widely spoken in the country, whether the country is a member of the World Trade Organization, and the real exchange rate.

Law et al (2009) resolve several complications that are associated with these kinds of model. One is that they take account of the fact that 28 percent of the export flows are zero when considering all possible destination countries. Similarly, 19 percent of the import flows are zero. Law et al (2009) take this into account by introducing 'selection' equations that explain when trade is non-zero. The data cover trade with more than 190 countries over the period 1981–2006.

The basic econometric estimates suggest that when the number of immigrants from a particular country increases by 10 percent, New Zealand exports to that country increase by 0.6 percent, while the volume of imports from that country increases by 1.9 percent.

The presence of New Zealand diaspora does not appear to boost New Zealand exports, but a 10 percent increase in the New Zealand diaspora would increase imports from their host country by around 1 percent. Given that the main destination countries for New Zealanders are culturally similar to New Zealand, it is not surprising that the New Zealand diaspora were not found to increase exports. This is because the 'home bias' in their preferences is expected to be little.

⁴⁹ See Genç et al (2010) for a meta-analysis of the empirical evidence reported in 48 studies.

⁵⁰ Genç et al (2010) concluded that an increase in the number of immigrants by 10 percent increases the volume of trade by about 1–2 percent.

⁵¹ This analysis is an update and extension of Bryant et al (2004).

Qian (2008) estimates a somewhat more simplified version of the gravity model but finds very similar coefficients: a 10 percent increase in the migrant stock increases exports by 0.56 percent and imports by 1.35 percent. Qian then carries out sensitivity tests to check whether these elasticities change with changes to the data. One test is to see whether it matters from which countries the migrants originate. Qian also checks whether there is a different effect from the presence of international students compared with the presence of people on temporary work permits or the total number of international visitors. The broad conclusion from this research is that immigrants from low-income countries and from different cultural backgrounds tend to create more trade than other groups.

Migration and tourism flows

Migration may also induce tourism flows, partly due to friendship and kinship networks. McCann et al (2010) studied visits back to New Zealand by New Zealanders living in Australia. They developed an economic theory to explain such visits in terms of 'relationship capital', which refers to the strength of the relationships between a person and their network of friends and relatives. From this, a flow of benefits is received, which are much larger when people meet face to face. Being overseas leads to the depreciation of relationship capital but trips to visit New Zealand allow replenishment. However, such trips require time and money. McCann et al develop a mathematical model that shows how often and for how long each migrant would visit their relatives and friends to get the maximum net benefit from these trips. Migrants further away from home, or for whom it was more costly to travel, were likely to visit less frequently, but stay away longer.

These predictions were confirmed by a longitudinal study of the international travel of a group of New Zealand and UK citizens living in Australia. Interestingly, it was also found that females were more likely than males to visit relatives and friends, while those on higher income also visited more frequently. Residents of the eastern states of Australia made visits more often than those in other parts of Australia, and people who migrated to New Zealand before they migrated to Australia visited family and friends abroad less frequently. In terms of age, those in their late 20s to early 30s were most likely to visit home.

In conclusion, migrants may become tourists when they return to their 'home' country, but they may also attract more tourism into the host country. Furthermore, tourism itself may trigger subsequent migration as tourists may become attracted to a country and subsequently desire to migrate there. This is particularly common in recent times in terms of retirement migration, for example from northwest Europe to Mediterranean countries. Moreover, tourism cannot be transferred spatially and it is often time-specific: this means that much of the labour force in the tourism sector must be available when and where the tourism services are consumed. Growth in tourism from abroad, therefore, generates an increase in the demand for seasonal and permanent workers that may be met by increased immigration, in turn fuelling further growth in tourism.

Besides the impact of migration on trade, Law et al (2009) also, therefore, estimate the impact of migration on tourism exports (visitor arrivals into New Zealand) and imports (New Zealanders visiting countries overseas). They find that tourism is strongly related to international migration. The coefficients are larger than for the trade in goods. However, the impact of immigration on inbound tourism is less positive than on outward tourism. When number of immigrants from a particular country increases by 10 percent, the number of visitor arrivals from that country increases 2 percent, but the number of New Zealanders visiting that

country increases 4 percent. Similarly, a 10 percent increase in New Zealanders living in that foreign country increases the number of visitor arrivals 1.3 percent and the number of family and friends visiting those New Zealand diaspora abroad increases 2 percent.

Discussion

Overall, the results suggest that inward migration stimulates New Zealand imports more than exports. This means that for the *source* countries of New Zealand immigrants, migration to New Zealand raises their exports more than imports. However, it is not the case that in all developed countries (usually net recipients of migrants), the impact on imports is bigger than on exports; nor is the opposite always true for developing countries (usually net senders of migrants). For example, in Australia the impact on exports appears to be larger than on imports (White and Tadesse, 2007), while in the United States the export impact is less than the import impact (White, 2010). The reasons for such differences between country studies are not yet clear. Nonetheless, the broad conclusion that immigration increases global trade rather than reduces it is supported by the empirical evidence (Genç et al, 2010).

In the New Zealand case, policy makers must take into account that increasing immigration may contribute to an increase in the current account deficit. Moreover, Law et al (2009) note that if the main benefit from remaining in touch with the New Zealand diaspora is the trade facilitation effect, this effect is minimised by the fact most New Zealanders abroad reside in English-speaking developed countries where the transactions costs for trade are already low. At the same time, coefficients of the impact of New Zealand immigration and emigration on trade are small so the impact on the balance of payments is likely to be swamped in practice by the myriad other factors that influence international trade.

6 FISCAL IMPACTS

The Government plays a significant role in the New Zealand economy. Central government income in 2009 was \$67 billion, equivalent to 35.8 percent of gross domestic product (GDP). About 57 percent of this was income tax. Local government income amounted to 3.4 percent of GDP. At the same time, the Government spent \$19 billion on social security and welfare, \$12 billion on health and \$11 billion on education. Given that immigrants account for one-quarter of the population, the impact of immigration on the Government's fiscal position is an important question.

As with the population overall, migrants pay tax on income and purchases of goods and services. They also consume government goods and services and claim benefits. Using available data on the income and consumption of overseas-born people living in New Zealand, the amount this group collectively contributes to government revenue (income, goods and services tax (GST) and excise) can be estimated. Similarly, using data on the demographic profile of immigrants and estimates of the cost per capita of providing public consumption and transfer payments to different demographic groups, an assessment can be made of how much government consumption on, for example education and health, and the level of transfer payments (such as welfare benefits and New Zealand superannuation) migrants collectively generate. Differences between migrant groups in terms of years in New Zealand, region of origin, and region of settlement can be taken into account. A comparison can also be made with the New Zealand-born population.

The first exercise in New Zealand of the kind described above was conducted by Poot et al (1988).⁵² In that study, the authors concluded that immigration increases government consumption per capita, primarily because migrants make the population demographically more youthful. This leads to an increase in education expenditure per capita, but a decrease in health expenditure per capita. Given the population structure and levels of expenditure at the time, the net effect was an increase in government consumption per capita. Poot et al (1988) also calculated that immigration reduced social security payments per capita. Finally, they found that after an increase in immigration, government revenue rises by slightly more than government expenditures,⁵³ but the net contribution in dollar terms of immigrants to the fiscal position was not calculated.

The first results of the latter type of accounting were reported in Nana and Williams (1999), which has been subsequently updated. The most recent results are reported in Slack et al (2007), a fiscal impacts study for 2005/06.⁵⁴

As at census night in March 2006, New Zealand had a migrant population of approximately 927,000. Slack et al (2007) estimated that this migrant population had a positive net fiscal impact of \$3,288 million in 2005/06. The New Zealand-born population of 3.1 million people had a lower net fiscal impact of \$2,838 million.

The net impact is made up of the difference between fiscal revenue and expenditure. The study estimated that migrants contributed a total of \$8,101 million through income taxes, GST, and excise duties. Estimated fiscal expenditure on the migrant population was \$4,813 million. This

⁵² Appendix A in Poot et al (1988) contains a detailed discussion of the public sector implications of international migration.

⁵³ Poot et al (1988, p 121).

⁵⁴ This study was conducted as part of the Department of Labour's EII research programme.

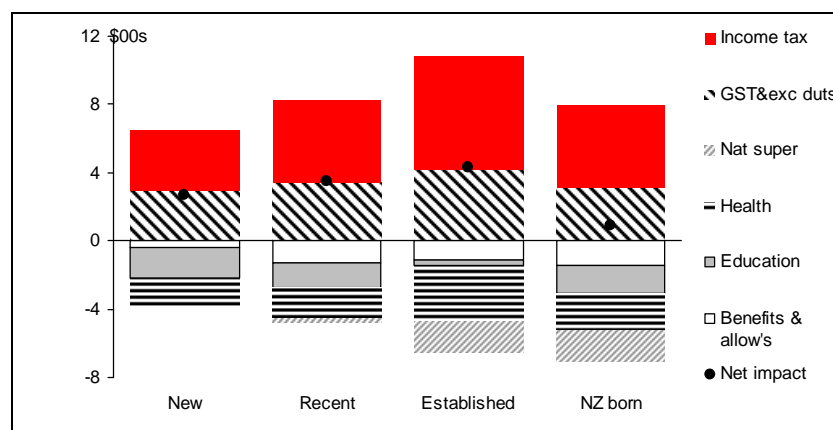
included government spending on education, health, benefits and allowances, and superannuation. In total, migrants contributed 24.7 percent of government revenue and accounted for 18 percent of government expenditure.

The study shows that all sub-groups of the migrant population analysed had positive net impacts, although the scale differed by the duration of residence, region of origin, and region of residence in New Zealand.

Net fiscal impact and duration of residence

The net fiscal impact of migrants *increases* with duration of residence. The net fiscal impact per head was \$2,680 for recent migrants (in New Zealand for up to 5 years), \$3,470 for intermediate migrants (in New Zealand from 5 to 15 years), and \$4,280 for earlier migrants (more than 15 years in New Zealand), while the comparable figure for the New Zealand-born population was \$915 per head. Figure 3 presents the fiscal impact by the revenue and expenditure categories.

Figure 3 Per capita fiscal impact by duration of residence, 2006



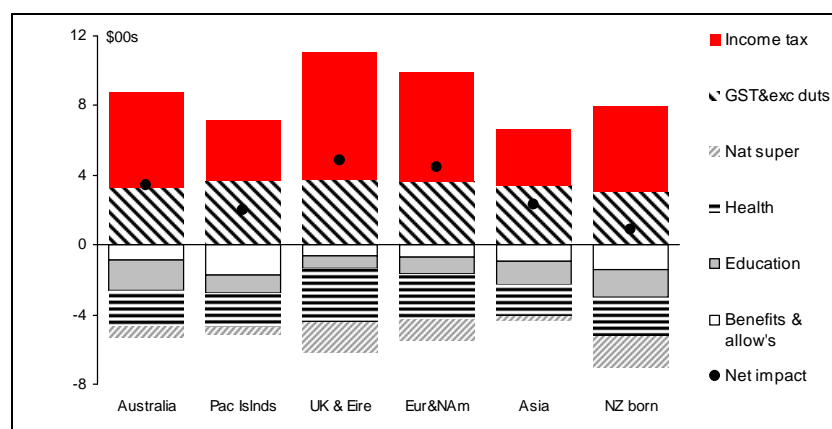
Note: The goods and services tax (GST) was charged at 12.5 percent on all final goods and services at the time. This rate is now 15 percent. National Superannuation (Nat Super) is not income tested and is available to most New Zealand residents aged 65 and over.

Net fiscal impact and region of origin

Figure 4 shows that the migrants from all regions of origin have a positive net fiscal impact. However, it also shows that significant differences exist between regions of origin. This reflects the different characteristics associated with region of origin. For example, those from the United Kingdom, Europe, and North America are likely to be skilled migrants. Many migrants from Asia, especially China, are foreign fee-paying students. Further, New Zealand has two residence categories that reflect its special relationship with the Pacific.⁵⁵ Although these categories still require a job offer, the entry requirements are lower.

⁵⁵ These categories are the Pacific Access Category and the Samoan Quota.

Figure 4 Per capita fiscal impact by region of origin, 2006



Note: The goods and services tax (GST) was charged at 12.5 percent on all final goods and services at the time. This rate is now 15 percent. National Superannuation (Nat Super) is not income tested and is available to most New Zealand residents aged 65 and over.

The demographic profile of migrants is the main cause of the net impact being larger for immigrants than for the New Zealand-born population. Migrants tend to be relatively young, are often single, and, given the policy requirements, are usually employed in relatively well-paid jobs. Moreover, the eligibility for some transfer payments (welfare and superannuation) depends on a minimum number of years of residence in New Zealand. Given the very strong links between age and the major public expenditure items of health and education, immigration tends to increase education expenditure and lower health expenditure per capita, with the net balance being a reduction in total expenditure per capita.

Limitations and discussion

Slack et al (2007) did not cover all components of government accounts. For example, settlement support expenses were not included as they were assumed to be one-off costs and often covered by the fees paid by migrants through the migrant levy.

A potentially more important omitted category is the large-scale public infrastructure investment that might be needed following the expansion of the population. This kind of expenditure is conceptually difficult to allocate to relatively small changes in the population resulting from immigration. There is also the question to what extent existing infrastructure is sufficiently underutilised to be able to cope with additional population without incurring congestion effects. This may be particularly important in New Zealand, where most new migrants settle in Auckland; a city in which, for example, investment in transportation infrastructure has not kept pace with increasing demand. However, it should also be noted in this context that Slack et al (2007) did not consider the emigration of New Zealanders and earlier immigrants. In fact, if the impact of outflows were also considered, the net effect of omitting capital investment is likely to be less because the outflows offset much of the impact of the inflow on infrastructure.

The methodology Slack et al (2007) used is also commonly used in other countries.⁵⁶ However, a common criticism of this methodology is that it takes a snapshot rather than a life-cycle approach to calculating the net fiscal impact. The longer-term impact of current migrants and their descendants is not reflected in the calculations. Essentially, it is assumed that the current

⁵⁶ See Rowthorn (2008) for a review.

fiscal revenues and expenditures that are associated with migrants of specific ages continue to apply in the future when these migrants have become older. Of course, it is possible to use discount rates to compare, for example, any future superannuation paid to a migrant with their current contribution to taxes. But unless information is available about the economic outcomes for migrants over their life cycle, the analysis remains static.

A fully dynamic analysis would answer the question, 'What is the discounted net contribution of recent immigrants over their life cycle to government revenue and expenditures, and how does this compare with the net contribution of earlier immigrants or of the host population?'. Dynamic models that attempt to answer such questions have been formulated (see, for example, Storesletten, 2000), but they require strong assumptions regarding immigrant fertility, the propensity to re-migrate, labour market participation, and future government spending and tax policies (Dustmann et al, 2009).

A life-cycle approach takes into account the changing contributions and expenditure claims associated with migrants and their children as they age right through to retirement obligations. It should be noted, however, that in the long run it is likely that the net fiscal contribution of a migrant will still be larger than that of a New Zealand-born person. Migrants who enter New Zealand and are of working age do not cost New Zealand in terms of their education and training. As a result, migration to New Zealand is likely to mean a net fiscal transfer to New Zealand.

Finally, the overall magnitude of any effect will also be influenced by whether the current budget is in surplus or deficit. The Slack et al (2007) study was conducted for 2005/06 when the Government was in budget surplus. As a result, the fiscal contributions of both migrants and the New Zealand born were positive.

7 INNOVATION IMPACTS

During the last three decades, much research has been devoted to the *short-run* impacts of immigration such as on wages, prices, and rents; geographic mobility; international trade; and the fiscal situation. The previous sections reviewed recent New Zealand research on these topics. A general conclusion from this research is that the economic impacts are generally positive but often quantitatively small. The calculus could change radically, however, if it could be shown that immigration improves the productivity of the economy either through *one-off* gains to efficiency and productivity of resources or through a *permanent* increase in the long-run growth rate of the economy.⁵⁷ This remains one of the hardest questions to answer in immigration economics. For example, it is impossible to know what the economic position of the United States would be now if it had not experienced significant net immigration during the 20th century. The counterfactual is simply not available.

Potential channels of long-run productivity effects

Nonetheless, researchers have recently shifted their attention to identifying potential channels of long-run productivity effects through which immigration may increase the growth rate of a country. Of particular interest are the channels through which immigration contributes to innovation in production, either through encouraging different ways of doing things or through generating new products and services.

Expanding the scale of the economy

The first possible channel is the expansion of the *scale* of the economy. Immigration boosts local aggregate demand. Such demand is partially met through additional imports, but predominantly through greater levels and greater variety of local production. While such output growth in the short run may be met by greater capacity utilisation and additional labour supply (predominantly provided by the immigrants themselves), in the long run additional investment will be needed. Such new investment will embody the latest technologies and the associated strategic behaviour of firms will encourage product and process innovation. Moreover, the resulting expansion of the host economy may lead to firm growth or additional start-up firms, which will also boost innovation. Furthermore, with migrants being predominantly attracted to the larger urban areas where job opportunities are the greatest, they contribute to urban population growth and increasing population density and thereby, as noted in section 5 on trade, strengthen the forces of agglomeration.

Another point is that a process of self-selection may mean the skilled workers who migrate may also be more entrepreneurial and less risk averse than those who do not migrate. Additionally, immigration is very selective of age, with most migrants being adults in their 20s or 30s. Consequently, immigration slows down the ageing of the population and the resulting more youthful workforce may be expected to be more innovative (Poot, 2008). Finally, migrants may also have a considerable ability to adapt to changing circumstances. In sum, the second mechanism through which immigration boosts innovation is by transforming the local work force.

⁵⁷ For a review of growth effects of immigration, see Bodvarsson and Van den Berg (2009, chapter 9).

Having admission policies that favour highly skilled workers

Probably the main way through which the composition of immigration can make the host economy more innovative is through explicit admission policies that favour highly skilled workers, such as the points system in New Zealand. Additionally, the global mobility of highly skilled workers has been increasing sharply (see, for example, Poot et al, 2008). Professional migrants often make multiple moves over their life course or even commute between multiple residences. This mobility behaviour generates spillover benefits to host countries in terms of transfers of new ideas and work practices that may encourage process and product innovations.

Generating greater cultural diversity in the host economy

The third mechanism through which immigration can boost innovation is by generating greater cultural diversity in the host economy. Historically and at present, the world's greatest cities are inhabited by large and diverse foreign populations. Jacobs (1961) argues that the city is the engine of growth of the economy and that immigrants, who are predominantly drawn to cities, contribute to this. The diversity one finds in cities in terms of the variety of commercial and cultural activities, and the ways in which new ideas and creativity are boosted in diverse urban environments, is highly beneficial for long-run development. In large cities many enterprises are run by migrant entrepreneurs or employ migrant workers. The benefits of size, density, and diversity in large cities yield higher returns to capital. The greater availability of workers of all types in the urban labour market decreases costly job search and imperfect matching. Moreover, Page (2007) convincingly argued that diverse cities and societies are also more resilient and better able to resolve the complex issues they face.

United States evidence

Empirical evidence on the association between immigration and innovation has only emerged in recent years. The productivity effects of immigration have been left in the 'too hard' basket for a long time. However, this topic is currently attracting a lot of attention internationally. As is often the case, much of the evidence comes from the United States.⁵⁸ The question is, 'How representative is this evidence is for the rest of the world?'

The main mechanism in the United States appears to be the education of foreign graduate students rather than skilled worker immigration. The United States is the global leader in academic research, so the country attracts the top foreign students from across the world (positive self-selection). These account for most doctoral graduates (but there appears to be no crowding out of the United States born from research universities) and many of these foreign-born doctoral students work in research and development (R&D) sectors in the United States, leading to a positive correlation between concentrations of highly skilled migrants and concentrations of patent activity.

Hunt (2009) found that, with respect to patents, there is a distinct advantage in recruiting top students who obtained their graduate education in the United States, rather than recruiting immigrants with graduate degrees from their home country.

⁵⁸ For a review of various studies and new evidence drawn from data on European regions, see Ozgen et al (2010).

New Zealand evidence

In New Zealand, Maré et al (2010) took a different approach of testing whether measures of innovation by firms are statistically correlated with the workforce composition in the local area in which the firms are located.⁵⁹ Specifically, they test the hypothesis that a relatively large presence of immigrants in the local area increases innovation while controlling for firm and other local labour force characteristics.

Firm-level data (including measures of innovation) were derived from Statistics New Zealand's prototype Longitudinal Business Database. Specifically, information from three separate business surveys, the 2001 Business Practices Survey, and the 2005 and 2007 Business Operations Surveys, were used. In total, nine measures of innovation were tested.⁶⁰ However, only two measures are consistent across all three surveys: new goods and services and new operational processes. The 2005 and 2007 Business Operations Surveys were consistent across all nine measures.

Local labour force information was obtained from the 2001 and 2006 censuses for people aged 18–65. The information includes qualification,⁶¹ birth place,⁶² and time in New Zealand.⁶³ Local labour force characteristics are calculated in 10 kilometre blocks.⁶⁴

Maré et al's (2010) descriptive analysis showed that the two largest labour market areas, Auckland and South Auckland, had the highest percentage of migrants, percentage of people new to the area, and employment density (and a relatively high-skilled workforce). Firms in these areas were found to have a higher-than-average likelihood of introducing new goods and services. However, the impact on new operational processes was found to be weaker. Nonetheless, this analysis confirms that the largest urban areas in New Zealand, which attract the largest numbers of migrants, are also a little more innovative.

Maré et al (2010) then used a maximum likelihood logit regression model to test the relationship between local workforce characteristics and innovation while controlling for firm characteristics. Initially, three workforce characteristics were included: the immigrant share in the population, percentage of degree holders, and percentage of people new to the area. The migrant share was then disaggregated into recent and earlier migrants. The New Zealand born returning from living overseas were also identified.

Data from the Business Practices Survey was excluded in some analyses to allow a broader range of innovation and control variables common between the 2005 and 2007 Business Operations Surveys to be used. For example, this allowed enterprises' use of skilled workers and expenditure on R&D to be included in the regression model.

The results suggest that only two factors have a strong predictive power in explaining the variation in innovation across firms: firm size and firm R&D expenditure. Large firms and/or

⁵⁹ This study was conducted as part of the Department of Labour's EII research programme.

⁶⁰ The measures of innovation were any innovation, new operational processes, new goods or services, new goods and services new to New Zealand, new goods and services new to world, new organisational/management practices, new marketing methods, entered new export market, and new staff as source of ideas.

⁶¹ Qualification was tertiary qualified or other education.

⁶² Birth place was overseas born or born in New Zealand.

⁶³ Time in New Zealand was arrived during the previous 5 years or earlier.

⁶⁴ Fifty-kilometre areas were tested but found not to significantly change the results.

those that devote money to R&D generate more product and/or process innovations. The presence of migrants (internal or international) and the characteristics of the labour force more generally do not have a statistically discernable influence on innovation outcomes. Even when controlling for subgroups of enterprises that have positive R&D expenditure, are in high R&D industries, or have a highly skilled workforce themselves, no evidence is found.

Maré et al (2010) concluded that the lack of a clear link between innovation and local workforce characteristics suggests that the spillovers from immigration to innovation may not be as strong in New Zealand as it is overseas. However, they also noted that the findings may reflect distinctive features of New Zealand's innovation system.

Discussion

New Zealand's relatively small size and low population density may limit the scope for innovative spillovers and the scope for dense networks of innovators to which immigrants could contribute. The importance of land-based activities that have shaped New Zealand's innovation and R&D system (with the concentration of research activity in the rural Waikato, the Manawatu, and Canterbury) may also limit the influence of immigrants, who are disproportionately located in the metropolitan areas. In fact, manufacturing in New Zealand accounts for only 11 percent of total employment, so the New Zealand issue is predominantly what drives primary sector and services innovation.

The New Zealand results are rather surprising in the light of recent international evidence that innovative firms tend to be found in regions with greater ethnic diversity or with larger migrant shares. Interestingly, much of the recent overseas research suggests that it is not the immigrant *share* that matters for innovation, but the presence of *high-skilled* immigrants. This was also tested by Maré et al (2010) and found not significant. While disentangling causation from correlation in this kind of research remains difficult, it is interesting not only that the migrant share is not significant, but also that virtually all 'ecological' variables (characteristics of the local area) are insignificant in the New Zealand research.

Unfortunately, the firm-level data did not allow a test of the within-firm effect of the presence of migrants, because there was no information on the composition of the firm's own work force, except for the use of skilled labour.

8 COMPUTABLE GENERAL EQUILIBRIUM MODELLING OF SECTORAL AND ECONOMY-WIDE IMPACTS OF IMMIGRATION

For considering the implications of varying levels of immigration on the economy, and the sensitivity of such economic outcomes to immigration policy, the CGE model is a natural tool. (Poot and Cochrane, 2004, p 33)

The previous sections reviewed a variety of ways in which immigration can influence the economy. In practice, such effects will occur simultaneously. There are also likely to be spillovers from one type of effect on another. For example, high-skilled immigration may boost investment and innovation, which could improve the competitiveness of the New Zealand economy. In turn, this could lead to more trade and higher incomes, which also improves the fiscal balance of government.

To take account of the myriad ways in which a change in immigration levels could influence the economy, a computer model is needed that mimics the workings of the economy at the desired level of detail. Given the complexities of the economy and the huge data requirements to generate a model that can realistically simulate at a high level of detail how the economy would change if some policy change with respect to immigration were adopted, only a limited number of models of the New Zealand economy are readily available that would be suitable or could be developed. Both in Australia and New Zealand, the commonly used tool for this kind of analysis associated with immigration policy (an exogenous change in the number and composition of immigration) is the so-called computable general equilibrium (CGE) model.

Origin of computable general equilibrium models

CGE models originated from the input–output models introduced by Wassily Leontief, but assign a more important role to prices and wages.⁶⁵ The central assumption of CGE modelling is that after some shock to the economy, market forces lead to changes in prices, wages, production, and consumption that will bring the economy back to equilibrium in which demand equals supply. Thus, where Leontief assumed that the amount of labour needed to produce a particular quantity of output would be proportional to the output, a CGE model would allow wage levels to negatively affect labour demand.

Leif Johansen's (1962) multi-sectoral growth model of the Norwegian economy formed the basis of the development of CGE models in Australia and New Zealand. Poot et al (1988) used a 22-sector CGE model of the New Zealand economy to calculate the economic impacts the various levels of immigration. As noted in the introduction, the drastic changes to the New Zealand economy since the 1980s warranted a revisiting of the conclusions regarding such impacts.⁶⁶

⁶⁵ Dixon and Rimmer's (2002) discussion of the MONASH model for Australia provides a good example of such models abroad. They have also been developed at the global level (see, for example, Hertel, 1997) and at regional level (see, for example, Partridge and Rickman, 2008).

⁶⁶ CGE models have also been used in several other countries to assess the economic impacts of changes in the level of immigration or emigration in those countries. Examples are: Australia (Giesecke and Meagher 2006; Productivity Commission 2006); Scotland (Lisenkova et al 2008); Germany and the United Kingdom (Baas and Brücker 2010); South Africa (Bohlman 2010); and the United States (Chojnicki et al 2011).

Variables used in computable general equilibrium models

CGE models always contain more variables than equations, requiring some variables to be set outside the model. These variables are termed exogenous; the remainder, determined by the model, are called endogenous.

The choice of which variables are to be exogenous is called the model 'closure'. Variables defining the technology of production, consumer tastes, and the policies of the Government (such as tax rates and public spending) are usually considered exogenous.⁶⁷

Strengths of computable general equilibrium models

One of a CGE model's strengths is that there is a lot of experience with this kind of modelling in Australia and New Zealand. Another strength is that CGE modelling allows a detailed description of the immigration 'shock' to be analysed, taking account of immigrant gender, age, occupation, experience, ethnicity, and so on. Also, the new research findings on the effects of immigration on trade, innovation, and productivity growth can be fed into the model. Another strength is that the fiscal impact can be calculated beyond the 'first round' accounting approach that was discussed in section 6 to assess the marginal tax revenue generated and marginal fiscal expenditure incurred from a group of new migrants. Finally, CGE models are particularly suited to 'what if' scenario simulations and do not require forecasting of the path of the economy.

Weaknesses of computable general equilibrium models

Nonetheless, CGE models also have various weaknesses. First, results are very sensitive to the macro closure: what you 'get' at the macro level is largely what you 'put in'. Particular issues of concern are assumptions about the aggregate level of new investment, the total stock of capital and natural resources, and the absence of modelling of monetary effects. Another problem in New Zealand is that the information about the input-output structure of the economy is out of date and there is little information at the regional level. Moreover, CGE models are not well suited to modelling endogenous technical change, dealing with activities that are non-market based, or taking account of how people form expectations.

Use of a computable general equilibrium model in the EII

On balance, though, the CGE model is a very useful tool for quantitatively assessing the economic impacts of changing immigration levels. Nana et al (2009), therefore, used such a model to obtain a better understanding of the impact of immigration on the contemporary New Zealand economy overall and on different parts of the economy. This was achieved by modelling changes to the scale of the immigrant inflow and by changing the focus of immigration to target higher-skilled immigrants. The model also tested the impact of additional influences that immigrants might have on productivity and trade. Finally, Nana et al compared the results from the model with those from Poot et al (1988) and a more recent study undertaken for the Australian economy (Productivity Commission, 2006).

⁶⁷ Thus, when considering the impact of immigration on the economy, the effect on health and education expenditure is through the impact on the age composition of the population, not an increase or decrease in the services provided to people of a particular age, gender or so on.

The baseline scenario assumed an average annual net immigrant flow of 20,000 (36,000 in and 16,000 out). A range of alternative scenarios were then considered. These assumed a 40,000 net inflow (56,000 in and 16,000 out) or a zero immigration inflow (0 in and 16,000 out). Alternative assumptions were considered with respect to technical change, international trade propensities, a changing skills mix of immigrants, and the absence of new investment. From an economy-wide perspective, the increased immigration scenarios investigated resulted in qualitatively similar impacts. In general, the results of the model scenarios found that increased immigration:

- reduce production costs
- improves the competitiveness of New Zealand goods and services, *benefiting exports*
- *benefits domestic investment and/or consumer spending*, depending on the skills composition of the immigration inflow
- yields higher revenues to government, which outweighs the impact on spending, so translates into an *improvement in the balance of the government's accounts*.

The four results listed above combine to *improve both real gross domestic product (GDP) and real GDP per capita*.

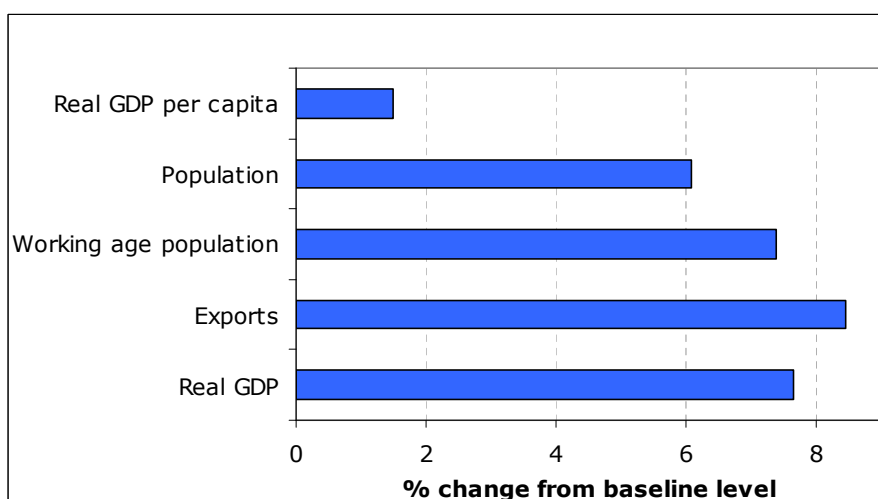
Major findings from the different scenarios modelled

The following describes the major findings from the different scenarios that were modelled. The scenarios predict outcomes for 2021 compared with a baseline level that is interpreted as a business-as-usual scenario with no major policy changes. Many core economic factors, such as productivity, export demand, terms of trade, and demographic changes, are held similar to recent historical levels.

An average annual net permanent and long-term inflow of 40,000 non-New Zealand-born migrants, double the inflow of the recent historical average of 20,000 in the baseline, was found to add 6.1 percent to the resident population in 2021 (see Figure 5). This took the population from 4.5 million in the baseline to 4.8 million in 2021, and added 7.4 percent to the labour available to the 2021 economy compared with that at the baseline. Real GDP would be 7.6 percent higher, taking GDP per capita up 1.5 percent or \$800 above the baseline in 2021. Differences in the make-up of this larger economy are most noticed in the external sector, with export volumes 8.5 percent above the baseline.⁶⁸

⁶⁸ This scenario lets the model determine the skill composition of the inflow.

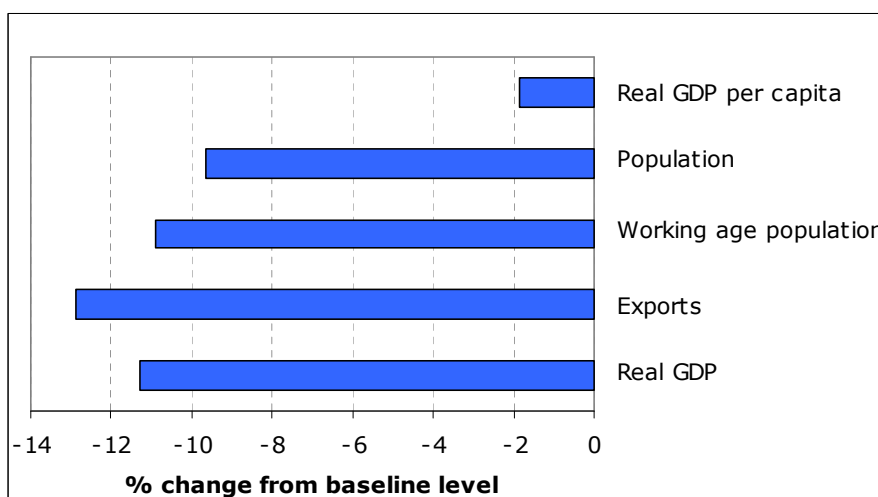
Figure 5 Economic impact in 2021 of doubling net immigration inflow



Alternatively, Nana et al (2009) also tested the impact of a total cessation of the current net immigrant inflow, while allowing an ongoing outflow of New Zealand and overseas born at current levels (see Figure 6). This scenario gives a New Zealand resident population of 4.1 million in 2021, 9.6 percent below the 2021 baseline population. Consequently, the labour available in 2021 is 10.9 percent below the 2021 baseline figure. The results for this scenario record GDP in 2021 at 11.3 percent below that of the baseline. GDP per capita is 1.8 percent, or \$1,000, below the baseline level.

The impact of this smaller economy is felt most by the export sector, where volumes in 2021 are 12.9 percent below the baseline. This effect arises from a higher price level, and therefore reduced competitiveness, which results from the smaller quantity of labour available.

Figure 6 Economic impact in 2021 of a zero immigration inflow



The difference between the baseline and the results for a zero net immigration inflow can be viewed as the value of the current level of immigration. Compared with a zero immigration inflow, net immigration at recent levels results in a significantly larger New Zealand population of 4.5 million and annual GDP of \$248 billion in 2021. Consequently, the aggregate addition to

the population of 437,000⁶⁹ arising from the current inflow of immigrants over the 15-year period yields an extra \$28 billion in GDP in 2021. That is, the inflow of immigrants at recent historical levels is estimated to be worth around \$1.9 billion per year to GDP. Without the continuation of the current net level of immigration, GDP per capita would be \$1,000 less in 2021 than it would be otherwise.

Experiments were also undertaken where the composition of the additional labour was specified in favour of particular high-skilled categories. Such a scenario can be seen as some change in policy direction or external impetus. Overall, this scenario resulted in a slightly higher impact on GDP with GDP 0.1 percent higher than in the scenario that did not specify the skill mix of the inflow. Additionally, there were small, but noticeable, differences in the make-up of the impact on GDP. In particular, the benefit to the export sector where the additional immigration inflow was of specific skills totalled 8.3 percent above baseline. This impact on exports is not as large as the 8.5 percent recorded in the scenario where the composition of the inflow was demand determined. An increase in domestic consumption made up the difference.

The fact that the GDP result is not a great deal higher than when the skill level is not directly specified illustrates how the export sector requires semi-skilled, as well as skilled, labour resources in order to expand its activities. For example, occupations such as machine operators and clerical staff in manufacturing, drivers in the transport sector, and sales and restaurant workers in tourism-related industries also benefit from export-related growth.

A scenario was also modelled that assumed that the level productivity accompanying the increased immigration in 2021 was 1 percent above the baseline. This assumption pushed the impact on GDP to 8.7 percent above the baseline, with GDP per capita 2.5 percent higher. The productivity improvements translate into lower per unit resource costs for New Zealand producers. This, in turn, means competitiveness gains for exporters. Such gains also flow through to income gains to the household sector, thus facilitating consumption gains.

Another scenario was motivated by the argument that increased immigration might assist New Zealand producers to develop new products, contacts, and export-market opportunities, as discussed in section 5. This argument, however, suggests there may also be an increased openness to importing activities. Consequently, this scenario models an increase in immigration accompanied by expanded world markets for New Zealand exports, as well as an increased market share for imports. The impact on GDP is similar to the impact without these assumptions, with GDP per capita 1.5 percent higher than in the baseline. Undoubtedly, there is an additional benefit to exports, with volumes 9.1 percent above baseline compared with the 8.5 percent recorded in the absence of these assumptions. This impact, however, is countered by a similarly larger impact on the import side of the GDP equation, although the expansion of exports is in the CGE model greater than of imports.

Nana et al (2009) concluded that increased immigration inflows would definitely result in a larger economy. Further, under the assumptions adopted for the scenarios presented here, increased immigration inflows resulted in a positive effect on GDP per capita. The current annual net inflow resulted in a significantly larger, and more externally focused, economy than a zero net inflow of immigrants.

⁶⁹ Although there is a 36,000 difference in the net annual inflows between the zero immigration scenario and the baseline, this difference is imposed gradually over the 15-year period. Thus, the 437,000 figure is less than 36,000 multiplied by 15.

Entirely high-skill immigration inflows

The modelling experiments do not support arguments in favour of entirely high-skill targeted immigration inflows. Such targeting does not appear to significantly increase the overall benefits to increased immigration flows. When an economy grows, labour is required at all levels. This finding supports the need for a demand-driven policy aimed at filling genuine shortages and not just focusing on the high-skilled. Although this result highlights the need for a range of skill levels to enable the economy to grow, it does not tell us about the appropriate policy to attract the potential immigrants (for example, different types of permits might be required to attract immigrants with different skill levels).

Among the range of assumptions tested, additional benefits increase significantly only when productivity improvements accompany the increased immigration inflow. This suggests that if immigration policies or programmes were to target particular skill categories, the focus should be directed to those skills that have significant potential to improve overall productivity.

Impact of capital–labour ratio assumption

It was noted earlier that the macro closure can have an important impact on the conclusions of the CGE model. Nana et al (2009) assume that the aggregate capital–labour ratio is in the long run unaffected by changing levels of immigration. While this is a reasonable assumption in a small open economy, it should be noted that it is the critical assumption that leads to a positive impact on GDP per capita. Net inward migration increases the rate of return to capital, which subsequently leads to a capital inflow until the real rate of return is restored to its old level. A capital inflow that keeps the aggregate capital–labour ratio constant was previously assumed by Poot et al (1988) and may still be considered a valid assumption now, given the extensive international evidence on the long-run wage impact of immigration being very small.

With the additional capital included in the model, the results for GDP of a positive immigration shock are rather more attractive. The greatest impact is achieved when an assumption of total factor productivity growth of 1 percent is included.⁷⁰ A formal analysis that net immigration generates this kind of productivity growth has still to be conducted in the New Zealand context.

Immigration's impact today compared with 20 years ago

An interesting comparison is the outcome of the Poot et al (1988) simulations with those of Nana et al (2009), because this highlights why immigration has a different impact now than it did some 20 years ago. The difference is predominantly due to the change in the composition of immigration, in labour force participation, in the sectoral structure of the New Zealand economy, and in the response of the New Zealand economy to an exogenous labour supply shock.

The effects on wages and prices are similar in the two studies, but a given immigration shock (the population change is almost identical in the two studies) benefits the economy now *more* than it did two decades ago. This is predominantly the case because of the increase in aggregate labour force participation and the concurrent increase in the capital inflow. This

⁷⁰ Total factor productivity growth of 1 percent means that 1 percent more output can be obtained with the available labour and capital or, alternatively, that the previous level of output can be produced with a 1 percent smaller quantity of capital and labour resource.

implies that the 6 percent increase in population due to migration in the 1980s modelling left GDP per capita roughly unchanged, but is now expected to lead to an increase in GDP per capita of 1.5 percent. This is also because of the change in international trade: the reduction in unit production costs now benefits exports (which are far more diversified than 20 years ago, including greater exports of services such as tourism and education) more than in the past. The impact on imports is almost identical to what it was two decades ago.

Something that has not changed over the decades is the impact on per capita consumption. Net immigration is *not* an economic shock that increases per capita consumption (although the new results are slightly better than the 1988 results in this respect). The only way to improve per capita consumption is to increase total factor productivity growth. That leads to 6.9 percent household consumption growth resulting from 6.1 percent population growth. However, as noted earlier, there is no strong evidence that net immigration triggers total factor productivity growth in New Zealand.

A final difference between the 2009 study and the 1988 study is the housing market. The housing investment response in the new simulation is rather more subdued than that previously assumed. The impact could, in Nana et al (2009), have been underestimated. An additional 20,000 people per annum require roughly an additional 7,700 dwellings per annum (household size is expected to be around 2.6 in 2021). Dwelling construction in the 2021 baseline is likely to be much less than 20,000 units per annum, given household projections (it was 18,500 in 2008). So with the scenario of net immigration doubling from 20,000 to 40,000, housing investment could be 30–40 percent higher than in the baseline. Yet the model generates predicted increase in residential construction of 9.73 percent, which seems rather low. This is also in comparison to the Australian Productivity Commission (2006) report in which the industry that grows the most after an immigration shock is construction. The same may be expected to be the case in New Zealand.

9 NEW RESEARCH AGENDA

Summary of progress and gaps in the research

Poot and Cochrane (2004) identified a large list of topics that were likely to be fruitful avenues for further research on the economic impacts of immigration. It is now timely to assess what gaps remain after the considerable research progress made during the last 5 years. Table 2 shows which of these topics have been addressed extensively, have been neglected, and are being investigated. Projects conducted under the EII research programme are also indicated.

Future research areas

Plenty of research has been conducted and other work is under way, but there are still areas from the wish list that would be fruitful to explore, including the following six areas.

Generational accounting approach to assessing the fiscal impact of immigration

A static approach to assessing the fiscal impact of immigration is the most common in the literature and is worthwhile updating. A dynamic analysis would allow the changing patterns of contributions and expenditure to be analysed throughout the migrant life cycle. This would also allow a more robust policy analysis on the fiscal implications of policy change.

Path of adjustment and induced physical and human capital investment in the economy

An assumption made in the CGE modelling work of Nana et al (2009) was that in the long run the aggregate capital-labour ratio remains unchanged. This assumption was also used in the earlier work of Poot et al (1988). It would be beneficial to empirically test this assumption.

Economic consequences of greater diversity

An extensive body of literature has found that firms operating in dense urban areas are more productive. This is often referred to as agglomeration. For example, Maré and Graham's (2009) study of impacts of employment density on firm productivity found that areas with 10 percent more employment density have firms that are 0.69 percent more productive. There is some debate as to the causes of these benefits. One of the less investigated sources could be that social diversity can be a source of dynamism and innovation.

Differences in impacts between temporary and long-term migration

Most data sources available for studying the economic impacts of immigration do not distinguish between the type of permit a migrant has. Other surveys such as the Longitudinal Survey: New Zealand focus only on certain types of permanent residents. However, migrants with different entry requirements may have quite different labour market experiences through the types of jobs they get and/or different motivations.

Household compared with individual outcomes












Much of the current research on economic integration focuses on the individual rather than the household. A focus on the outcomes for households would be beneficial, especially where family investment decisions are at play. Family investment strategies can allow an individual to search for longer without having to settle for a lesser job or allow the individual to increase their human capital through some form of country-specific training. On the other hand, families may decide that one of the parents stays at home at first to help their children settle, entering the labour market as the family integrates.








Saving behaviour

Finally, there have not yet been any studies of the impact of immigration on saving behaviour (except for the work by Gibson et al (2007) on wealth and a longitudinal analysis of saving behaviour by Le et al (2010)). A study focusing specifically on immigrant saving behaviour has recently been conducted in Australia (Islam et al, 2010) and could well be replicated for New Zealand.

Table 2 Research progress 2005–2010 compared with topics listed in Poot and Cochrane (2004)

Issue	Progress	EII	Authors	Notes
1 The impact of immigration on wages and employment using the geographical area-based approach, the experience-based approach, or the factor proportions approach, using census or Household Labour Force Survey income supplement data.		✓	Maré and Stillman (2009)	This has been done with combined New Zealand Income Survey and census data.
2 The impact of immigration (including effects of policy changes) on employment, unemployment, and labour turnover indicators by means of time series data from the Household Labour Force Survey.				Vector autoregressive modelling by Motu Economic and Public Policy Research and the Reserve Bank of New Zealand.
i3 The relationship between immigration and the short-run job prospects of unemployed residents by means of the methodology of, for example, Chapman and Cobb-Clark (1999).		✓	Maré and Stillman (2009)	Not directly done.
4 The measurement of the impact of immigration on internal and international migration patterns of the locally born.			Stillman and Maré (2007)	Done with respect to internal migration, but not international migration. It would be useful to conduct an analysis of the extent to which immigration encourages trans-Tasman migration of the New Zealand born (if there is a correlation, it is causal because net immigration would normally be associated with buoyant economic conditions and therefore a <i>reduction</i> in the net outflow to Australia).
5 An update of Winkelmann and Winkelmann (1998) of migrant adaptation by means of econometric earnings functions.			Stillman and Maré (2009)	Work with census data being conducted under objective 1 of the Integration of Immigrants Programme (IIP)
6 Selective emigration of former immigrants and the impact on local labour markets.		✓	Maré and Stillman (2009)	More work is needed.
7 The impact of migrant geographical clustering on migrant wages, employment, productivity, and innovation.		✓	Maré and Stillman (2009); Maré, et al (2010)	Additional studies on clustering in Auckland are being conducted, including work on productivity under the Economic Impacts of Immigration (EII) research programme.

Issue	Progress	EII	Authors	Notes
8 The spillover benefits from entrepreneurial migration.				Being conducted under objective 2 of IIP
9 The relationship between immigration and total factor productivity growth.				Formal econometric modelling of this still has to be done in New Zealand.
10 The post-settlement human capital accumulation of migrants and differences in rates of return to such investment for migrants and for the native born.			Poot and Stillman (2010); Stillman and Velamuri (2010)	Under objective 1 of IIP.
11 The efficiency and effectiveness of post-settlement services and assistance.				
12 Immigrant self-selection and motives for migration to New Zealand.				Being conducted under objective 1 of IIP; and by IMSED Research.
13 The contribution of business migration to innovation and the spillovers to the economy generally.		✓	Maré et al (2010)	Only to the extent of the area effect.
14 The relationship between migration and international trade at a disaggregated level.			Qian (2008); Law et al (2009)	
15 A generational accounting approach to assessing the fiscal impact of immigration.		✓	Slack et al (2007)	Snapshot approach only
16 The effect of immigration on income inequality.				Only indirectly by Motu Economic and Public Policy Research. The impact on the variance in income (for example, inter-quartile range) has not been calculated.
17 The incidence and impact of migrant discrimination in the labour market.			Ward and Masgoret (2007)	See also Human Rights Commission (2010).
18 Internal migration patterns of international migrants.		✓	Maré et al (2007)	

Issue	Progress	EII	Authors	Notes
19 The effect of immigration on local housing markets: house prices and rents, new building activity, and homeownership rates.		✓✓	Sanderson et al (2008); Maré and Stillman (2008)	See also Coleman and Langdon-Lane (2007) and Grimes et al (2007)
20 Macro analysis of immigration with models of the New Zealand economy to assess the impact on gross domestic product, the rate of inflation for given monetary policy conditions, and the effect on the balance of payments.		✓	Nana et al (2009)	Also done by Reserve Bank of New Zealand models.
21 The long-run consequences of the inflow of students.			Infometrics et al (2008)	Impact study
22 Long-run differences in the economic impact of temporary worker migration and permanent settlement.				A major topic for future research
23 The impact of immigration on gross fixed capital formation (investment) other than housing.		✓	Nana et al (2009)	Only done through CGE model, not econometrics of behaviour.
24 Differentials between immigrant groups in consumption patterns.				Work by Le et al (2010) estimate migrant savings behaviour.
25 A full-scale computable general equilibrium model analysis of the economy-wide, sectoral, and labour market effects of specific immigration scenarios.		✓	Nana et al (2009)	

Note: Full references are in the list at the end of this report.



= Not addressed



= Partially addressed



= Work under way



= Partially addressed and work under way



= Addressed

10 SUMMARY

In recent decades, immigration has become a greater feature of the New Zealand labour market. In 2006, 25 percent of the working-age population were born overseas. This was up from 22 percent in 2001 and 18 percent in 1981. Between 2001 and 2006 the working-age population grew by around 271,000 people and, of these, about 60 percent were overseas born.

In many cases, immigrants are not direct substitutes for New Zealand workers. Immigrants initially tend to have lower employment rates and incomes than the New Zealand born with similar characteristics, and it can take time to integrate into the labour market. Higher-skilled immigrants tend to converge faster, and those with lower skills take much longer. Interestingly, immigrants who arrive while they are still children have outcomes that are indistinguishable from those of comparable New Zealand-born individuals.

In theory, immigrants are more likely to settle in areas with one of two features: a strong labour market, or where they know people or there are plenty of people from their country of origin. The evidence for New Zealand shows that recent migrants are more likely to settle in areas where a larger proportion of previous migrant populations from their region of origin are present and less likely to settle in areas with greater-than-average numbers from other regions. Surprisingly, no evidence is found that recent migrants choose to settle in areas with better-than-average labour market outcomes. However, there is some evidence that earlier migrants are more likely to have relocated to areas with better-than-average labour market outcomes for the general population. This suggests that labour market conditions become a more important determinant of settlement location in the longer term. However, migrant networks remain the dominant factor over time.

Microeconomic or sectoral impacts

Often, the general question is asked, 'Do immigrants compete with New Zealanders for jobs and subsequently displace New Zealanders or impact upon conditions such as wages?'. The evidence points to immigration as having no adverse impact on the labour market outcomes of the native-born population. There is general agreement that, with all else being equal, an increase in the supply of labour would lower wages. However, in practice, all else is not equal: an increase in immigration triggers a range of effects both in the short term and the long term, and these may offset the negative impact of a positive labour supply shock. The greatest impact found was that of very recent migrants on other recent migrants.

An immediate impact that immigrants can have is in the demand for housing. *Real* house prices went up by almost 80 percent between March 2002 and March 2007. At the same time, there was a net increase of 130,000 permanent long-term migrants.⁷¹ It should also be considered that generally the demographic profile of the inflow of immigrants is different to the outflow of New Zealanders; with immigrants frequently being slightly older and having children. This, along with cultural differences, means that immigrant housing demand may differ to the housing stock vacated by those leaving the country.

All of the studies included in this report found a relationship between immigration and house prices at the national level. However, the studies that included analysis at the local level found much weaker relationships. Further, when the composition of the inflows was disaggregated,

⁷¹ Around 520,000 arrivals and 390,000 departures (Statistics New Zealand – Infoshare).

the impact of an inflow of immigrants to an area was negligible, but positive for returning New Zealanders. Given the uneven distribution of immigrants across New Zealand, if immigration were the key driver of recent house price inflation, then it would stand to reason that areas with higher inflows of immigrants would also have incurred the highest levels of house price appreciation. This was found not to be the case, so suggests that the relationship at the national level may be a consequence of omitted factors that raise both immigration and house prices.

Another sector of the economy that immigration can impact on is external trade. Generally, immigration stimulates trade in two ways. The first is through immigrants demanding 'ethnic' goods from their country of origin that are not made locally (or not made to the same standard). The more different the source and host country are, the greater this effect. The second way that immigration stimulates trade is through migrants lowering the transaction costs of trade through networks, language, or local knowledge. Overall, results confirm that migration stimulates trade in New Zealand. However, it stimulates imports more than exports—that is, the first impact dominates the second. Some other countries are similar to New Zealand in this respect, in others the net effect is the opposite (see Genç et al 2010). The conclusion for New Zealand is that policy makers must take into account that an increase in immigration may contribute to an increase in the current account deficit. The impact of expatriate New Zealanders on trade was small. This can be explained, as New Zealanders are more likely to emigrate to countries that are culturally similar, hence their impact on trade may be comparatively small.

Fiscal impacts

A common method used to illustrate the contribution (or otherwise) of migrants is to estimate the impact they have on public finances. Like other members of society, migrants pay taxes (including income tax, goods and services tax, excise, and duties), can claim benefits, and are immediately or after some time eligible for government-funded goods and services. It was estimated that the immigrant population, of 927,000, had a positive net fiscal impact of \$3,288 million in 2005/06. The New Zealand-born population of 3.1 million had a lower net fiscal impact of \$2,838 million. In total, migrants contributed 40 percent more to government revenue than they received in government expenditure.

The study showed that all sub-groups of the migrant population had positive net impacts, although the scale differed by the duration of residence, region of origin, and region of residence in New Zealand. The net fiscal impact of migrants increased with duration of residence.

The demographic profile of migrants was the main reason the net impact is larger for immigrants than for the New Zealand-born population. However, it should be noted that in the long term it is likely that the net fiscal contribution of a migrant will remain greater than that of a New Zealand-born person. This is because working-age migrants who enter New Zealand do not cost New Zealand in terms of their education and training. As a result, migration to New Zealand is likely to mean a net fiscal transfer to New Zealand.

Innovation impacts

Only two factors were found to have a strong predictive power in explaining the variation in innovation across firms: firm size and firm research and development (R&D) expenditure. Large

firms and/or those that devote money to R&D generate more product and/or process innovations. The presence of migrants and the characteristics of the labour force (such as skill levels) more generally do not have statistically discernable influences on innovation outcomes. This finding holds, even when controlling for different subgroups of enterprises, such as those that have positive R&D expenditure, are in high R&D industries, or have a highly skilled workforce.

New Zealand's relatively small size and low population density may limit the scope for innovative spillovers between firms and for dense networks of innovators to which immigrants might contribute. The importance of land-based activities that have shaped New Zealand's innovation and R&D system (with concentration of research activity in the rural Waikato, Manawatu, and Canterbury) may also limit the influence of immigrants, who are disproportionately located in the larger urban areas. Given that manufacturing in New Zealand accounts for only 11 percent of total employment, the main issue is what drives primary sector and services innovation.

Economy-wide impacts

A computer model was used to take account of the myriad ways in which various immigration levels might influence the economy. An average annual net permanent and long-term inflow of 40,000 non-New Zealand-born migrants (which represents twice the inflow of the recent historical average of 20,000 in the baseline) was found to add 6.1 percent to the resident population in 2021. This also meant that by 2021 the population increased from a projected 4.5 million using the baseline scenario to 4.8 million, and in terms of labour available added 7.4 percent more than offered by the baseline. Real GDP in 2021 would be 7.6 percent higher, increasing GDP per capita by 1.5 percent or \$800 above the baseline. Differences in the composition of this larger economy are most noticed in the external sector, with export volumes 8.5 percent above baseline.⁷²

The impact of a total cessation of the current net immigrant inflow, while allowing an ongoing outflow of New Zealand and overseas born at current levels, was also tested by the model. This scenario results in a New Zealand resident population of 4.1 million in 2021, 9.6 percent below the 2021 baseline population. Consequently, the labour available in 2021 is 10.9 percent below the 2021 baseline figure. The results for this scenario record GDP in 2021 at 11.3 percent below the baseline. Consequently, GDP per capita is 1.8 percent or \$1,000 below the baseline level. The impact of this smaller economy is most severe upon the export sector, where volumes in 2021 are 12.9 percent below the baseline. This effect arises from a higher price level, which in turn leads to reduced competitiveness—all of which results from the smaller supply of available labour.

Overall: positive contribution to economic outcomes

We conclude that immigration has made a positive contribution to economic outcomes in New Zealand, and that fears for negative economic impacts such as net fiscal costs, house price inflation, and increasing unemployment are largely unfounded.

⁷² This scenario let the model determine the skill composition of the inflow.

Future research

Future research should focus on the path of adjustment over time, induced physical and human capital investment in the economy, the consequences of greater diversity, and differences in impacts between temporary and long-term migration.

REFERENCES

- Aghion, P, and Howitt, P. 2009. *The Economics of Growth*. Cambridge, MA: MIT Press.
- Baas, T, and Brücker, H. (2010) Macroeconomic impact of Eastern enlargement on Germany and UK: evidence from a CGE model. *Applied Economics Letters* 17(2): 125-128.
- Bedford, RD, and Poot, J. 2010. Changing tides in the South Pacific: Immigration to Aotearoa New Zealand. In: UA Segal, D Elliott and NS Mayadas (eds) *Immigration Worldwide*. New York: Oxford University Press, pp 257–273.
- Belshaw, H. 1952. *Immigration, Problems and Policies*. Wellington: Wright and Carman.
- Bodvarsson, ÖB, and Van den Berg, H. 2009. *The Economics of Immigration: Theory and policy*. Berlin: Springer Verlag.
- Bohlman, HR. 2010. The Macroeconomic Impact of Skilled Emigration from South Africa: A CGE Analysis. Melbourne: Centre of Policy Studies, Monash University.
- Borjas, GJ. 2003. The labor demand curve is downward sloping: Reexamining the impact of immigration on the labor market. *Quarterly Journal of Economics* 118(4): 1335–1374.
- Borjas, GJ. 2006. Native internal migration and the labor market impact of immigration. *Journal of Human Resources* 41: 221–258.
- Borjas, GJ, and Friedberg, RM. 2009. *Recent Trends in the Earnings of New Immigrants to the United States*. Working paper 15406. Cambridge, MA: National Bureau of Economic Research.
- Brakman, S, Garretsen, H, and van Marrewijk, C. 2009. *The New Introduction to Geographical Economics*. Cambridge, UK: Cambridge University Press.
- Bryant, J, Genç, M, and Law, D. 2004. *Trade and Migration to New Zealand*. Working paper 04/18. Wellington: New Zealand Treasury.
- Bryant, J, and Krsinich, F. 2009. *Attrition in the Longitudinal Immigration Survey: New Zealand*. Presented at the New Zealand Association of Economists Conference 2009. Wellington: Department of Statistics.
- Card, D. 2001. Immigrant inflows, native outflows, and the local labor market impacts of higher immigration. *Journal of Labor Economics* 19(1): 22–64.
- Chapman, B, and Cobb-Clark, D. 1999. A comparative static model of the relationship between immigration and the short-run job prospects of unemployed residents. *Economic Record* 75: 358–368.
- Chojnicki, X. Docquier, F. and Ragot, L. 2011. Should the US have locked heaven's door? Reassessing the benefits of postwar immigration. *Journal of Population Economics* 24(1): 317–359.
- Coleman, A, and Landon-Lane, J. 2007. *Housing Markets and Migration in New Zealand, 1962–2006*. Discussion paper DP2007/12. Wellington: Reserve Bank of New Zealand.
- Collins, J. 2003. Cultural diversity and entrepreneurship: Policy responses to immigrant entrepreneurs in Australia. *Entrepreneurship & Regional Development* 15(2): 137–149.

- Department of Labour. 2009a. *Migration Trends and Outlook 2007/2008*. Wellington: Department of Labour.
- Department of Labour. 2009b. *New Faces, New Futures: New Zealand*. Wellington: Department of Labour.
- Dixon, P, and Rimmer, M. 2002. *Dynamic General Equilibrium Modelling for Forecasting and Policy: A practical guide and documentation of MONASH*. Amsterdam: North Holland.
- DPMC House Prices Unit. 2008. *Final Report of the House Prices Unit: House price increases and housing in New Zealand*. Wellington: Department of the Prime Minister and Cabinet.
- Dustmann, C, Frattini, T, and Halls, C. 2009. *Assessing the Fiscal Costs and Benefits of A8 Migration to the UK*. Discussion paper 18/09. London: Centre for Research and Analysis of Migration, University College London.
- EvalueResearch. 2010. *Final Evaluation Report of the Recognised Seasonal Employer Policy (2007–2009)*. Wellington: Department of Labour.
- Fix, M, Papademetriou, DM, Batalova, J, Terrazas, A, Yi-Ying Lin, S et al 2009. *Migration and the Global Recession*. Washington DC: Migration Policy Institute.
- Genç, M, Gheasi, M, Nijkamp, P, and Poot, J. 2010. *The Impact of Immigration on International Trade: A meta-analysis*. Amsterdam: Department of Spatial Economics, VU University.
- Gibson, J, Le, T, and Stillman, S. 2007. What explains the wealth gap between immigrants and the New Zealand born? *New Zealand Economic Papers* 41(2): 131–162.
- Gibson, J, McKenzie, D, and Stillman, S. 2009. *The Impacts of International Migration on Remaining Household Members: Omnibus results from a migration lottery program*. Discussion paper 20/09. London: Centre for Research and Analysis of Migration, University College London.
- Giesecke, J, and Meagher, GA. 2006. *Modelling the Economic Impacts of Migration and Population Growth*. Melbourne: Centre of Policy Studies, Monash University.
- Gould, JD. 1964. Some economic consequences of rapid population growth in New Zealand. *Landfall* 69: 74–87.
- Grimes, A, Maré, DC, and Morten, M. 2007. *Adjustment in Local Labour and Housing Markets*. Working paper 07/10. Wellington: Motu Economic and Public Policy Research.
- Haig, R. 2010. *Working across the Ditch: New Zealanders working in Australia*. Wellington: Department of Labour.
- Hanson, GH. 2008. *The Economic Consequences of the International Migration of Labor*. Working paper 14490. Cambridge, MA: National Bureau of Economic Research.
- Hertel, T (ed). 1997. *Global Trade Analysis: Modeling and applications*. Cambridge, UK: Cambridge University Press.
- Holmes, F. 1966a. Some thoughts on immigration. *Quarterly Predictions of National Income and Expenditure* no. 9: 18–24.
- Holmes, F. 1966b. Some thoughts on immigration. *Quarterly Predictions of National Income and Expenditure* no.10: 18–22.
- Holmes, F. 1967. Some thoughts on immigration. *Quarterly Predictions of National Income and Expenditure* no. 11: 19–24.
- Human Rights Commission. 2010. *Confident, Equal and Proud? A discussion paper on the barriers Asians face to equality in New Zealand*. Wellington: Human Rights Commission.
- Hunt, J. 2009. *Which Immigrants are Most Innovative and Entrepreneurial? Distinctions by entry visa*. Working paper 14920. Cambridge, MA: National Bureau of Economic Research.

- Infometrics, NRB, and Skinnerstrategic. 2008. *The Economic Impact of Export Education*. Wellington: Education New Zealand and Ministry of Education.
- Integration of Immigrants Programme 2007–2012*. No date. <http://integrationofimmigrants.massey.ac.nz>
- Islam, A, Parasnis, J, and Fausten, D. 2010. *Immigrant and Native Saving Behaviour in Australia*. Melbourne: Department of Economics, Monash University.
- Jacobs, J. 1961. *The Death and Life of the Great American Cities*. 1993 Modern Library Edition. New York: Random House.
- Johansen, L. 1962. *A Multi-Sectoral model of Economic Growth*. Amsterdam: North-Holland.
- Law, D, Genç, M, and Bryant, J. 2009. *Trade, Diaspora and Migration to New Zealand*. Working paper 2009/4. Wellington: New Zealand Institute of Economic Research.
- Le, T, Gibson, J, and Stillman, S. 2010. *Household Wealth and Saving in New Zealand: Evidence from the Longitudinal Survey of Family, Income and Employment*. Working paper 10-09. Wellington: Motu Economic and Public Policy Research.
- Lisenkova K, McGregor P, Pappas N, Swales JK, Turner K, and Wright, RE. 2008. The Macroeconomic Impacts of Demographic Change in Scotland: Evidence from a Computable General Equilibrium Model. Strathclyde: University of Strathclyde.
- Longhi, S, Nijkamp, P, and Poot, J. 2005. A meta-analytic assessment of the effect of immigration on wages. *Journal of Economic Surveys* 19(3): 451–477.
- Longhi, S, Nijkamp, P, and Poot, J. 2008. *Meta-Analysis of Empirical Evidence on the Labour Market Impacts of Immigration*. Discussion Papers 3418. Bonn: Institute for the Study of Labor.
- Longhi, S, Nijkamp, P, and Poot, J. 2010a. Joint impacts of immigration on wages and employment: Review and meta-analysis. *Journal of Geographical Systems* DOI: 10.1007/s10109-010-0111-y.
- Longhi, S, Nijkamp, P, and Poot, J. 2010b. Meta-analyses of labour market impacts of immigration: Key conclusions and policy implications. *Environment and Planning C: Government and Policy* 28: 819–833.
- Maré, DC, Fabling, R, and Stillman, S. 2010. *Immigration and Innovation*. Commissioned by the Economic Impacts of Immigration research programme of the Department of Labour. Wellington: Department of Labour.
- Maré, DC, and Graham, DJ. 2009. *Agglomeration Elasticities in New Zealand*. Working paper 09-06. Wellington: Motu Economic and Public Policy Research.
- Maré, DC, Morten, M, and Stillman, S. 2007. Settlement patterns and the geographic mobility of recent migrants to New Zealand. *New Zealand Economic Papers* 41(2): 163–196. (Commissioned by the Economic Impacts of Immigration research programme of the Department of Labour.)
- Maré, DC, and Stillman, S. 2008. *Housing Markets and Migration: Evidence from New Zealand*. Wellington: Department of Labour.
- Maré, DC, and Stillman, S. 2009. *The Impact of Immigration on the Labour Market Outcomes of New Zealanders*. Commissioned by the Economic Impacts of Immigration research programme of the Department of Labour. Wellington: Department of Labour.
- McCann, P, Poot, J, and Sanderson, L. 2010. Migration, relationship capital and international travel: Theory and evidence. *Journal of Economic Geography* 10(3): 361–387.

- McGill, JF. 1981. *Immigration and the New Zealand Economy*. Research Paper 26. Wellington: New Zealand Institute of Economic Research.
- McKenzie, D, Gibson, J, and Stillman, S. 2010. How important is selection? Experimental vs non-experimental measures of the income gains from migration. *Journal of the European Economic Association* 8(4): 913–945.
- McKenzie, D, and Yang, D. 2010. *Experimental Approaches in Migration Studies*. Discussion paper 17/10. London: Centre for Research and Analysis of Migration, University College London.
- Meares, C, Poot, J, and Spoonley, P, with Bedford, R, Bell, A, and Ho, E. 2009. The Economic Integration of Immigrants Programme 2007–2012. *New Zealand Sociology* 24(1): 113–124.
- Meares, C, Ho, E, Peace, R, and Spoonley, P. 2010. *Bamboo Networks: Chinese employers and employees in Auckland*. Albany: Integration of Immigrants Programme, Massey University.
- Monetary and Economic Council. 1966. *Increased Immigration and the New Zealand Economy*. Report 12. Wellington: Government Printer.
- Nana, G, and Sanderson, K. 2008. *Migrants and Labour Market Outcomes*. Working paper. Commissioned by the Economic Impacts of Immigration research programme of the Department of Labour. Wellington: Department of Labour.
- Nana, G, Sanderson, K, and Goodchild, M. 2003. *The Fiscal Impact of Migrants to New Zealand*. Wellington: Business and Economic Research Ltd.
- Nana, G, Sanderson, K, and Hodgson, R. 2009. *The Economic Impacts of Immigration: Scenarios using a computable general equilibrium model of the New Zealand economy*. Working paper. Commissioned by the Economic Impacts of Immigration research programme of the Department of Labour. Wellington: Department of Labour.
- Nana, G, and Williams, J. 1999. *Fiscal Impacts of Migrants to New Zealand*. Wellington: Business and Economic Research Ltd.
- OECD. 2009. *International Migration and the Economic Crisis: Understanding the Links and Shaping Policy Responses*. Paris: OECD.
- OECD. 2010. *Equal Opportunities: The labour market integration of the children of immigrants*. Paris: Organisation for Economic Co-operation and Development.
- Ozgen, C, Nijkamp, P, and Poot, J. 2010. *Immigration and Innovation in European Regions*. Amsterdam: Department of Spatial Economics, VU University.
- Page, SE. 2007. *The Difference: How the power of diversity creates better groups, firms, schools, and societies*. Princeton: Princeton University Press.
- Partridge, MD, and Rickman, DS. 2008. Computable general equilibrium (CGE) modeling for regional economic development analysis. *Regional Studies* iFirst.
- Pekkala Kerr, S, and Kerr, W. 2009. *Economic Impacts of Immigration: A survey*. Working paper 09-013. Cambridge MA: Harvard Business School.
- Poot, J. 1993. Adaptation of migrants in the New Zealand labour market. *International Migration Review* 27(1): 121–139.
- Poot, J (ed). 2004. *On the Edge of the Global Economy*. Cheltenham, UK: Edward Elgar.
- Poot, J. 2008. Demographic change and regional competitiveness: The effects of immigration and ageing. *International Journal of Foresight and Innovation Policy* 4(1/2): 129–145.
- Poot, J. 2010. Trans-Tasman migration, transnationalism and economic development in Australasia. *Asian and Pacific Migration Journal* 19(3): 319–342.

- Poot, J, and Cochrane, B. 2004. *Measuring the Economic Impact of Immigration: A scoping paper*. Research report commissioned by the Department of Labour. Wellington: Department of Labour. (Also available as Poot, J, and Cochrane, B. 2005. *Measuring the Economic Impact of Immigration: A scoping paper*. Discussion paper 48. Hamilton: Population Studies Centre, University of Waikato.)
- Poot, J, Nana, G, and Philpott, B. 1988. *International Migration and the New Zealand Economy*. Wellington: Institute of Policy Studies, Victoria University of Wellington.
- Poot, J, and Stillman, S. 2010. *The Importance of Heterogeneity when Examining Immigrant Education–Occupation Mismatch: Evidence from New Zealand*. Discussion Paper 5211. Bonn: Institute for the Study of Labor.
- Poot, J, and Strutt, A. Forthcoming. International trade agreements and international migration, *The World Economy*.
- Poot, J, Waldorf, B, and van Wissen, L (eds). 2008. *Migration and Human Capital*. Cheltenham, UK: Edward Elgar.
- Productivity Commission. 2006. *Economic Impacts of Migration and Population Growth: Final report*. Australia: Productivity Commission.
- Qian, M. 2008. *The Economic Relationship between Trade and Immigration in New Zealand*. Working paper 1/2008. Albany: Integration of Immigrants Programme, Massey University.
- Rowthorn, R. 2008. The fiscal impact of immigration on the advanced economies. *Oxford Review of Economic Policy* 24(3): 560–580.
- Saiz, A. 2003. Room in the kitchen for the melting pot: Immigration and rental prices. *Review of Economics and Statistics* 85(3): 502–521.
- Sanderson, K, Nana, G, Norman, D, and Wu, J. 2008. *The Economic Impact of Immigration on Housing in New Zealand, 1991–2016*. Commissioned by the Economic Impacts of Immigration research programme of the Department of Labour. Wellington: Centre for Housing Research Aotearoa and Department of Labour.
- Slack, A, Wu, J, and Nana, G. 2007. *Fiscal Impacts of Immigration 2005/06* Working paper. Commissioned by the Economic Impacts of Immigration research programme of the Department of Labour. Wellington: Department of Labour.
- Spoonley, P, and Bedford, R. 2008. Responding to regional labour demand: International migration and labour markets in New Zealand’s regions. *Journal of International Migration and Integration* 9: 203–223.
- Statistics New Zealand. 2010. *New Zealand in Profile*. Wellington: Statistics New Zealand.
- Stillman, S, and Maré, DC. 2007. *The Impact of Immigration on the Geographic Mobility of New Zealanders*. Working paper 07-05. Wellington: Motu Economic and Public Policy Research.
- Stillman, S, and Maré, DC. 2008. *Housing Markets and Migration: Evidence from New Zealand*. Working paper. Commissioned by the Economic Impacts of Immigration research programme of the Department of Labour. Wellington: Department of Labour.
- Stillman, S, and Maré, DC. 2009a. *The Labour Market Adjustment of Immigrants in New Zealand*. Working paper. Commissioned by the Economic Impacts of Immigration research programme of the Department of Labour. Wellington: Department of Labour.

- Stillman, S, and Maré, DC. 2009b. Labour market outcomes for immigrants in New Zealand. In: PS Morrison (ed). *Labour, Employment and Work in New Zealand: Proceedings of the 13th conference*. Wellington: School of Geography, Environmental and Earth Sciences, Victoria University of Wellington.
- Stillman, S, McKenzie, D, and Gibson, J. 2009. Migration and mental health: Evidence from a natural experiment. *Journal of Health Economics* 28: 677–687.
- Stillman, S, and Velamuri, M. 2010. *Immigrant Selection and the Returns to Human Capital in New Zealand and Australia*. Wellington. Department of Labour.
- Storesletten, K. 2000. Sustaining fiscal policy through immigration. *Journal of Political Economy* 108(2): 300–323.
- Strutt, A, Poot, J, Dubbeldam, J. 2008. *International Trade Negotiations and the Trans-Border Movement of People: A review of the literature*. Discussion paper68. Hamilton: Population Studies Centre, University of Waikato.
- Trlin, AD. 1992. Change and continuity: New Zealand's immigration policy in the late 1980s. In: AD Trlin and P Spoonley (eds). *New Zealand and International Migration. A digest and bibliography number 2*. Palmerston North: Department of Sociology, Massey University.
- Trlin, AD. 1997. For the promotion of economic growth and prosperity: New Zealand's immigration policy, 1991–1995. In: AD Trlin and P Spoonley (eds). *New Zealand and International Migration: A digest and bibliography number 3*. Palmerston North and Albany: Department of Sociology, Massey University.
- UNDP. 2009. *Human Development on the Move*. New York: United Nations Development Programme.
- Ward, C, and Masgoret, A. 2007. Immigrant entry into the workforce: A research note from New Zealand. *International Journal of Intercultural Relations* 31: 525–530.
- White, R. 2010. *Migration and International Trade: The US experience since 1945*. Cheltenham, UK: Edward Elgar.
- White, R, and Tadesse, B. 2007. Immigration policy, cultural pluralism and trade: Evidence from the white Australia policy. *Pacific Economic Review* 12: 489–509.
- Winkelmann, L, and Winkelmann, R. 1998. *Immigrants in the New Zealand Labour Market: A study of their labour market outcomes*. Wellington: Department of Labour.
- Woolf, J. 2010. *The Economic and Social Outcomes of Children of Migrants in New Zealand*. Wellington: Department of Statistics.