Looking at the numbers

A view of New Zealand's economic history

Chapters: Population and Labour market

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Originally published in 2003
Updated in 2007 and 2016

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Research monograph 69
ISSN 0113 1877
ISBN 0 908969 12 0

Preface

The New Zealand Institute of Economic Research (NZIER) was founded in 1958 as a non-profit making trust to provide economic research and consultancy services. The institute is probably best known for its long-established *Quarterly Survey of Business Opinion* and *Quarterly Predictions.* The institute also undertakes a wide range of consultancy activities for government and private organisations.

This monograph has been prepared at NZIER by Phil Briggs. The assistance of Vhari McWha, Ralph Lattimore, Alex Sundakov, Doug Steel, John Yeabsley, Frances Gamble, Sarah Spring, Corina Basher, Cherloe Morgan, Daniel Briggs and Liz Hodgson is gratefully acknowledged. Thanks also to Grant Scobie and Katie Katyan at the Treasury for supplying a number of the long-term data series that they have collected.

It was first updated in 2007 and subsequently in 2015.

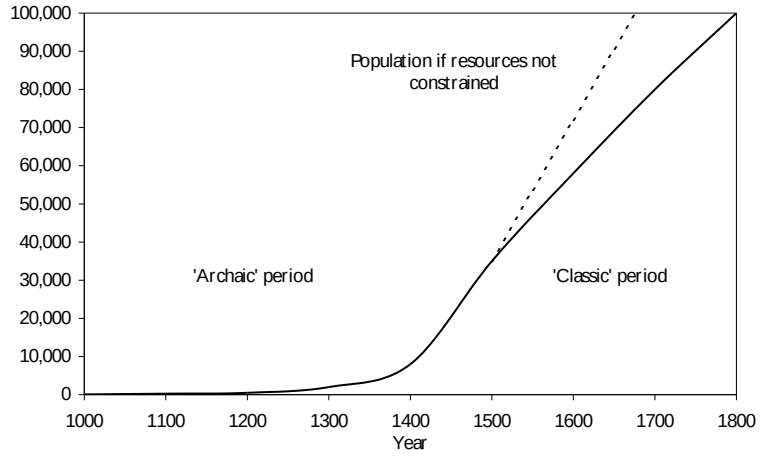
This monograph has been completed with a grant from NZIER's public good research fund. The data used in this report are available on www.nzier.org.nz and https://data1850.nz .

Population

Māori population

Ironically the first graph we look at, Figure 1, doesn't show historical data, but rather hypothetical estimates. The figure shows a possible scenario for the growth of the Māori population in pre-European times. The population increases from 10 in the year 1000 (which is such a low figure that is impossible to see on the chart), to 100,000 in 1800. How can we be sure about these figures? We can't. For a start, we don't know for sure when Māori arrived. The earliest sites that have been discovered—and most of these are in the South Island—suggest that settlement began in around 1200. However, it's possible that people were here earlier than that but that they are 'archeologically invisible', that is, we haven't found any evidence of them.

Figure 1 Conceptual model of Māori population 1000–1800



Source: Adapted from McKinnon et al (1997), plate 11

But let's focus for now on the other end of the chart. The figure of 100,000 is largely based on Captain Cook's estimate, which he made while on one of his voyages to New Zealand in the late 1700s. While

Cook's estimate has become well known, its origins are a little mysterious. Pool (1977) suggests that the original reference to Cook's estimate of 100,000 appears in a book by Johann Reinhold Forster, *Observations made during a voyage round the world, 1772–75*, published in London in 1778. Forster sailed with Cook on his second voyage to New Zealand. It is not clear whether the estimate was Cook's, Forster's or a joint effort. There is also no indication as to how the estimate was derived. Forster was inclined to the view that Māori population was in fact larger than 100,000.

Until fairly recently, many would have agreed that the figure was an underestimate, and that the pre-contact Māori population could have been 200,000 or higher (McKinnon et al, 1997).

But Pool (1991) expresses a different view. He notes that by 1858, when the first census of the Māori population was undertaken, the census enumerators could find only 56,000 Māori. This figure was probably an underestimate, with the true figure being close to 60,000. Even so, is it plausible that a population could decline from 100,000 or more in the early 1770s to 60,000 by 1858?

Pool makes what he thinks are realistic assumptions about Māori death rates over this period and works backwards from the 1858 figure. He does this in two stages, estimating the population in 1840, and then the population in 1769. He suggests that the population in 1840 was in the order of 70,000–90,000. Regarding the 1769 population, he concludes that it may have been about 100,000 or slightly less.

It seems therefore that Cook's estimate of 100,000 for the Māori population at the time of contact may have been a reasonable one, although it may still be a little on the high side.

Turning back to Figure 1, is it feasible that a population could grow from practically nothing to 100,000 within 800 years? Pool also looks at this issue and he notes that the final size of the population is dependent on:

- The size of the founding population
- The time at which the founding population arrives
- The growth rate of the population.

This growth rate is dependent on birth rates and mortality rates.

Pool postulates that the annual growth rate would not have exceeded 0.5 percent (or 5 per 1000). This growth rate would be consistent with a birth rate of 30 per 1000 with an accompanying death rate of 25. Or, alternatively, it would be consistent with a birth rate as high as 45 per 1000 with an accompanying death rate of 40. Using this growth rate, Pool calculates the population size in 1769 assuming various founding population sizes and settlement dates.

Pool finds that even with a founding population of 400, which is the largest that he assumes, this population would have had to arrive in New Zealand before 700 AD in order to reach 100,000 by 1769. This arrival date does not seem reasonable.

Pool suggests that population growth among the first settlers may in fact have been rapid, especially given the rich food resources available from hunting, gathering, and fishing. Rapid growth in the early period of settlement, even if it tailed off later, would make the 100,000 population size attainable in a shorter period. Another factor, one that is not discussed by Pool, is that the population may not have grown from just one founding population—the original population was being added to, especially in the early days, by the arrival of more migrants from east Polynesia. This would have increased the chance of the population reaching 100,000. Even so, again it appears that our figure of 100,000 for 1769 is a 'maximum' estimate.

Figure 1 incorporates higher growth rates in the earlier years. But then resource constraints begin to hinder population growth with total population dropping below the dotted line shown in Figure 1. The occurrence of resource constraints is supported by the appearance of pa, or fortified settlements, from about 1500. Around 6,000 pa sites have been found around New Zealand (McKinnon et al, 1997, plate 11). The emergence of fortified settlements suggests that defending areas of land became important, and that control of access to land and sea became vital for survival. The move to fortified settlements may have also reflected an increasing dependence on horticulture, following the extinction of the moa.

Let's briefly consider the pre-European economy from a present day perspective. The rise in population over the period to 1800

suggests that the pre-European economy grew in terms of total output. However, growth in output per person may have actually declined in certain periods, especially when moa hunting ended. Archaeological evidence suggests that in some locations, such as at the Waitaki river mouth, the butchering of moa was of factory-like proportions. Output per person may have also eased as resources other than the moa became less abundant.

Estimating technical change in Māori society is difficult. Clearly a major technological step was the development of storage pits for kumara. The development of the arts, such as wood carving—where there are clear differences between the 'archaic' and 'classical' periods—would suggest that significant advances were made in the development of tools. Developments in housing and in clothing also occurred. Māori did in fact successfully adapt Polynesian culture, which had been developed in tropical climates, to one that sustained them in a temperate climate. Given the way the Māori population grew in Aotearoa, the conclusion must be that this adaptation was very successful.

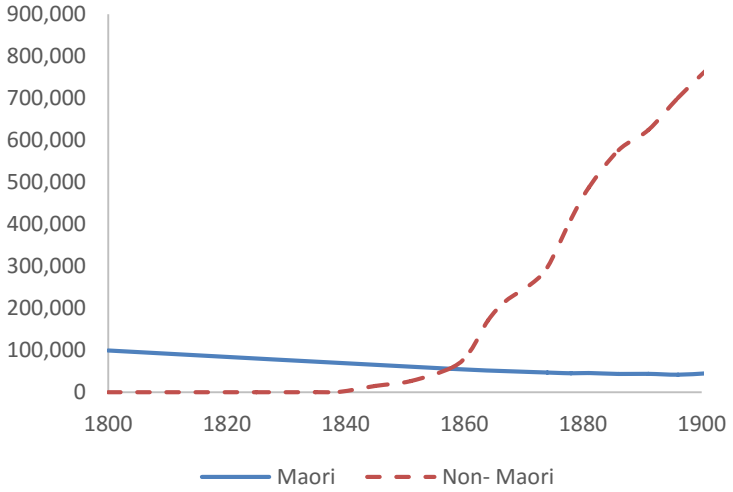
Figure 2 though highlights the difficult times that the Māori population went through in the 19th century. The population declined from just under 100,000 in 1800 to around 80,000 in 1840. As mentioned earlier, the first census of Māori in 1858 produced a figure of just 56,000, although the actual population was probably close to 60,000.

In contrast, the non-Māori population, which was estimated at 2,000 in 1840, had grown to 59,000 at the time of the 1858 census, and was estimated at 71,600 in 1859. Within 19 years of the signing of the Treaty of Waitangi, the pākehā population had grown to be larger than the Māori population. It seems unlikely that this is what Māori expected when signing the treaty. After all, they had been living with Europeans in their midst for around 50 years prior to the treaty, and had not seen explosive growth in pākehā numbers in that time. At the time of the treaty, Māori still outnumbered pākehā by a ratio of 40 to 1. It seems likely that in signing the treaty, most Māori had been seeking to formalise existing arrangements with the pākehā—doing

a deal that would bring benefits to both sides—rather than consciously opening up the way for a pākehā takeover.

Figure 2 Population 1800–1901

Population totals



Source: McKinnon et al (1997), Pool (1991), census data from official yearbooks

Nevertheless, the influx of pākehā was quick. By 1842, Wakefield's New Zealand company had founded settlements at Wellington, Wanganui, New Plymouth and Nelson. Dunedin was established in 1848 and Christchurch in 1850. The growth in the non-Māori population in the 1840–1860 period averaged nearly 3,900 a year, giving an average compound growth rate of 20.1 percent per annum. But as Figure 2 shows, even stronger growth was to come in the 1860s, following the discovery of gold. Growth averaged 16,900 per annum over this decade. By the end of the 19th century, the non-Māori population had climbed to 768,000, or over seven times higher than the Māori population at the time of first European contact.

Māori fared badly over most of the 19th century, with the total population dropping to 42,000 by the time of the 1896 census. But

this was the low point. By 1901, the total was 45,550 and the Māori population recovered strongly during the 20th century.

What caused the sharp decline in the Māori population, especially in the period to 1858? Pool (1991) discusses some of the factors. Mortality rates may have climbed due to inter-tribal warfare, which in some areas was being waged with guns obtained from Europeans. However, estimates of death rates from such activity may have been exaggerated by early settlers, who were keen to secure annexation. Perhaps a more important factor was the internal migration that arose as a result of these musket wars. As Pool notes, normal economic life would have been severely disrupted. Food production may have declined and mortality increased. (For more on the musket wars see Crosby 1999.)

Another factor was the introduction of diseases by the first Europeans. Colds, influenza, bronchitis, and pneumonia swept through many tribes and death rates may have been high. There were also outbreaks of measles and whooping cough. But perhaps the biggest impact came from venereal diseases, which would have had a serious impact on fertility. There is evidence that these diseases were introduced at the time of Cook's first voyage. The results of the 1858 census and earlier mission records suggest that sterility among Māori women was reasonably high, which would be consistent with venereal disease being prevalent.

The fall in the Māori population between 1858 and 1896 wasn't as severe as earlier and is perhaps a little easier to account for. The massive increase in the pākehā population meant even more exposure to European diseases. But the main factor was probably the loss of land, especially the losses that occurred as a result of the wars of the 1860s. The economic and social dislocation was massive and would have affected mortality rates.

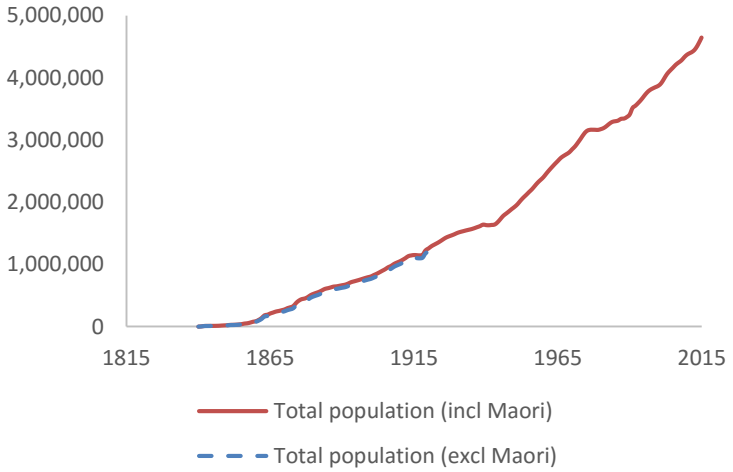
However, by the end of the 19th century it seems that Māori had gained some natural immunity to imported diseases and were adapting to a new social and economic environment.

Growth in non-Māori and total population

Figure 3 shows annual population estimates for the non-Māori population and for total population from 1840 through to 2000. The estimates for total population begin in 1875; prior to that, the annual estimates exclude Māori.

Figure 3 Population from 1840

Population totals as at December 31



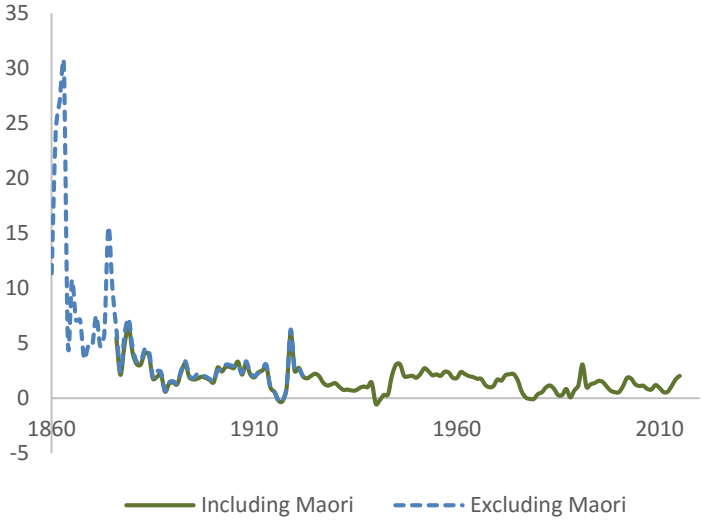
Sources: Official yearbooks, INFOS

Several features stand out. There is a noticeable dip in population in the late 1910s and again in the early 1940s. These are the effects of the world wars, with large numbers of males overseas. We should note that these population estimates, up to and including 1990, are for the actual population—the people who were within New Zealand, including visitors. This is often referred to as the 'de facto' population. From 1991, the estimates are for the 'usually resident' or 'de jure' population, which covers people who live in New Zealand. As the graph shows, an outflow of soldiers alters the de facto population. And as we know, some of these soldiers didn't come back.

Another feature of the graph is the steep increase in population over the period from the second world war to around 1975. While population growth does taper off a little in the late 1960s, as economic growth slows, population growth recovers again in the early 1970s, and gets back to the trend of the earlier post-war years. Still, we can see that population growth did in fact begin to 'wobble' from around 1966.

Figure 4 Population growth from 1850

Annual percent change



Sources: Official yearbooks, INFOS

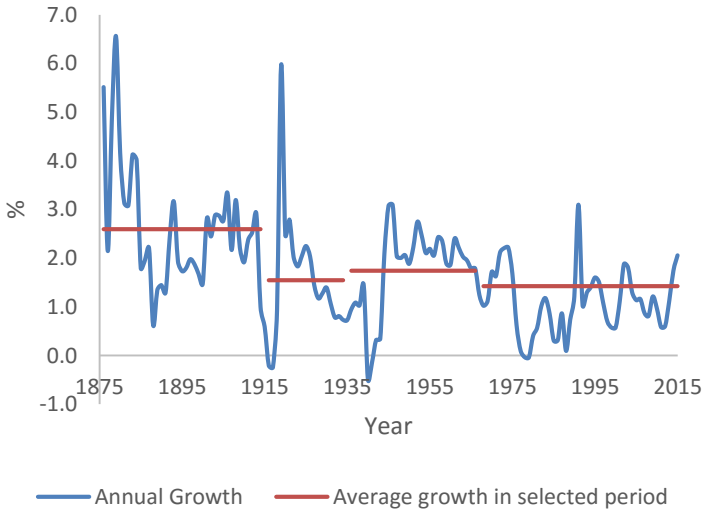
Figure 4 shows annual percent changes in growth from 1850. Note the very high percent changes in the early years. We have to remember that at this stage the population was very small and the growth is occurring off a low base. While the actual annual increases in population over this period were quite small, especially when compared to later periods, the total population is also very small, and this affects the annual percent changes. Nevertheless, an annual growth rate of 30.4 percent, which occurred in 1863 at the time of the gold rush, is pretty impressive. Note that in this chart the growth in

the 1945–1975 period doesn't look so impressive. Again though, this reflects the population base, which is now much larger.

Figure 5 is similar to Figure 4 but shows only the percent changes in total population, for which we have figures from 1875. The changed scale of the graph gives us a better picture of what went on since that time. Again, note the loss of population as the soldiers left for the two world wars, and the large gains as they came back.

Figure 5 Total population growth from 1875

Annual percent change



Sources: Official yearbooks, INFOS

It is worth looking closely at this chart, isolating the periods that we identified earlier: 1769–1870, 1870–1914, 1914–1934, 1934–1966, and 1966–2003. However, since our data for total population only runs from 1875, we will have to ignore the first period and begin our second period in 1875. Annual percent changes were generally high in the 1875–1914 period, before falling sharply in the 1914–1934 period. The next period, 1934–1966, shows some recovery in growth,

but growth then drops to a low level in the post-1966 period. The numbers bear this out (see Table 1).

In comparison, the annual compound growth rate for the earlier 1840–1875 period was 16.1 percent. However, this covers only the non-Māori population, rather than the total population, which was used in calculating the figures above. Still, this figure again highlights the explosive growth in non-Māori population in the years immediately after 1840.

Table 1 Population growth by period

Period	Annual compound growth rate
1875–1914	2.6%
1914–1934	1.5%
1934–1966	1.7%
1966–2015	1.4%

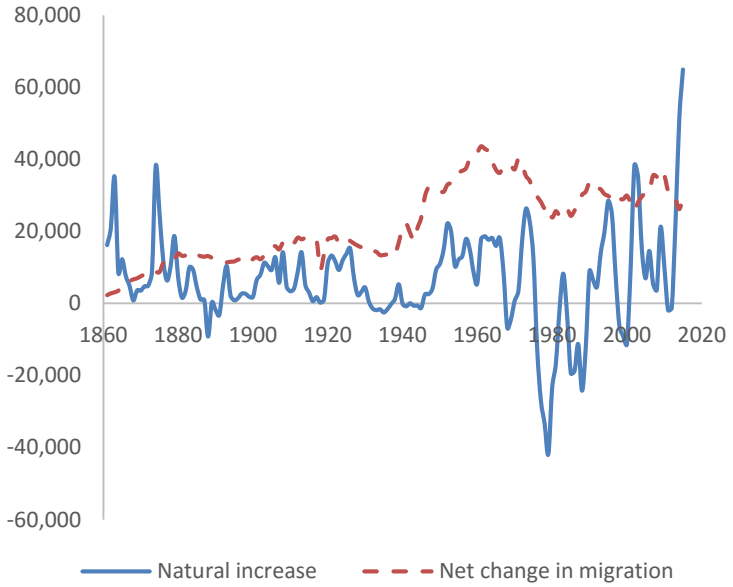
Sources: Official yearbooks, INFOS

Natural increase and migration

The two drivers of population growth are the 'natural increase', which is births minus deaths, and migration. Figure 6 shows the natural increase and the net change from migration (arrivals minus departures

Figure 6 Components of population growth

Annual change in population



Sources: Official yearbooks, *Statistics of population and buildings* volumes from Statistics New Zealand, INFOS

As one would expect, in the earlier years the change due to migration was higher than the change from the natural increase. The gold rushes of the 1860s and then Vogel's policy of assisted immigration in the 1870s boosted the net inflow of migrants. But from the late 1870s, the natural increase became the dominant factor and remained so until recent times. Interestingly, it wasn't until 1995 that the gain from net migration again exceeded the natural increase.

Other features worth noting:

- The natural increase dipped sharply during the first world war. It also eased back during the depression, then recovered, before taking another dip during the second world war. The natural increase was very high in the 1944–1966 period, reflecting high birth rates (the post-war 'baby boom').

- Net migration has fluctuated markedly over the years, and changes in migration are often seen as being an indicator of economic performance. Note, for example, the net losses in the late 1880s, which is often seen as a time of depression (more on this later). Net outflows also occurred in the early 1930s, at the time of the great depression, and in the late 1970s.

Note that the net migration numbers in Figure 6, which are official figures, do not appear to include troop movements. There is, for example, no large net outflow in the 1910s or 1940s. There were also continuing population gains from the natural increase during these periods, which implies that the total population also continued to rise during these periods. This isn't consistent with the population estimates in Figure 5 which showed the total population declining in the late 1910s and the early 1940s. Therefore it appears that the migration figures didn't account for troop movements while the estimates of total population did.

Note too that births prior to 1921 do not include Māori births.

Let's look at average annual figures for the natural increase and net migration for our five periods from 1769 as defined earlier (see Table 2). Unfortunately, we can't get migration data prior to 1861 so we'll have to shorten the first period.

These figures confirm what we found earlier:

- Natural increase soon took over from net migration as the major driver of population growth. By the time we get to the last period, 1966–2001, net migration accounts for less than one tenth of the total population growth.
- Net migration fell to relatively low levels in the 1914–1934 period.
- The 1934–1966 period showed strong gains from both the natural increase (the baby boom) and net migration.
- The gains from natural increase remained high in the 1966–2001 period. This is despite a fall in the birth rate that occurred during this period, and reflects the age structure of the population, with a substantial number of women being of child-bearing age. In general, this was the result of the original baby boomers having their own babies.

- In 2002 and 2003, for the first time since the late 19th century, net migration has been greater than natural increases. A tight labour market prompted a drive to attract immigrants to areas where there were skills shortages. At the same time, the economic conditions of the time possibly provided greater incentive for people to stay in New Zealand rather than emigrate.
- In 2015 New Zealand's annual net gain of migrants reached a record high, including the first net gain in migration from Australia since 1991.

Table 2 Sources of population growth by period

Average annual increase

Period	Arising from natural increase	Arising from net migration
1861–1870	5,005	11,370
1870–1914	13,052	6,860
1914–1934	16,177	5,318
1934–1966	30,064	8,616
1966–2015	30,670	4,933

Sources: Official yearbooks, *Statistics of population and buildings* volumes from Statistics New Zealand, INFOS

The demographic transition

Figure 7 shows birth rates and death rates since 1860. These are crude rates with, for example, the birth rate being expressed as the number of births per 1000 population.

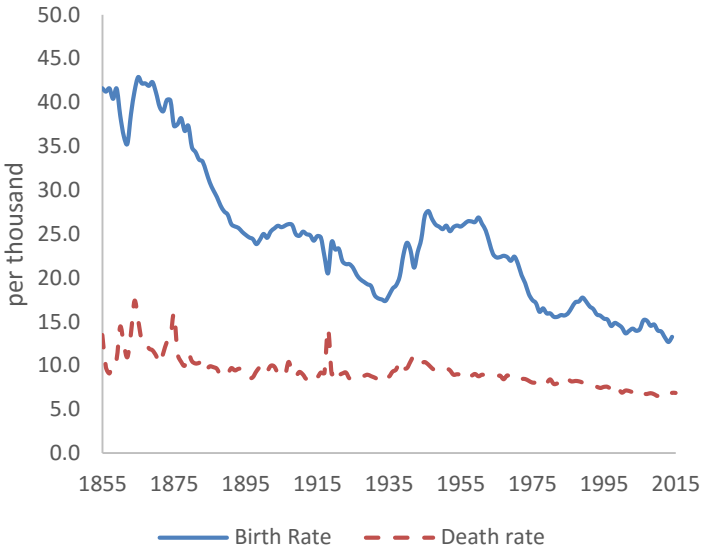
The striking feature is the long-term decline in the birth rate. The rate starts at nearly 42 births per 1000 people in 1860 and drops to under 15 births per 1000 people by 1998. The decline began around 1880. The rate lifted slightly in the early 1900s, probably reflecting buoyant economic conditions. Then from 1910 the birth rate began to decline again. The first world war produced a sudden 'down then up' movement but otherwise the overall decline continued until the mid-1930s.

Then came the baby boom. But by the mid-1960s the birth rate was declining again. The current birth rate is now below the replacement rate (that is, the birth rate at which a population replaces itself). While the crude birth rate is still higher than the crude death

rate, indicating that the population is still growing, this is due largely to the age distribution of the population.

Figure 7 Birth and death rates

Rate per 1000 population



Sources: Calculated from Statistcs New Zealand data for births, deaths, and total population

Figure 7 shows that the post-war baby boom was a temporary interruption to the long-run decline in birth rates. This long-term decline is often referred to as 'the demographic transition'. Such a transition tends to occur as a country develops economically. The transition begins with a lowering of the death rate as better hygiene and health care take effect. Then the birth rate also starts to decline. With fewer children dying, the need to keep having children declines. The development of social welfare probably also plays a part. With superannuation schemes in place it becomes less necessary for couples to have children that will support them in their old age. Many industrialised countries now face an inverse demographic pyramid with more people nearing retirement, or already retired than at working age. New Zealand also has the

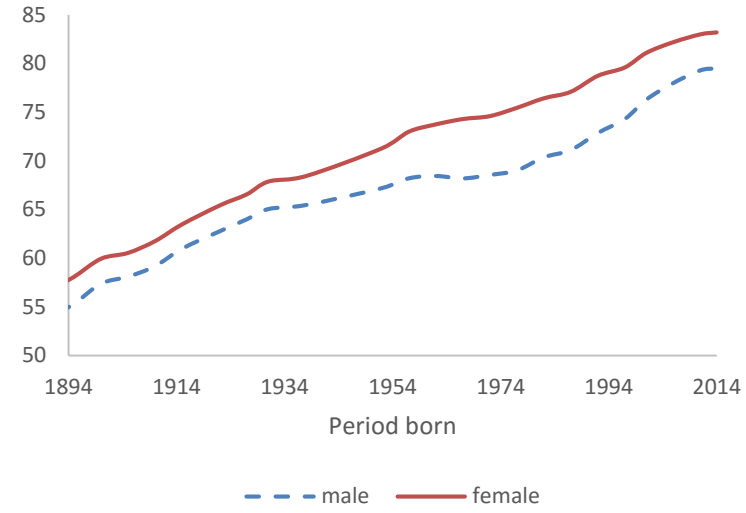
problem of a growing number of retired workers relative to people paying income tax, but currently have what has been labelled a population 'coffin' rather than an inverse pyramid. This is partially because the decline in births in New Zealand has not been as pronounced as in other countries, such as Japan, and also because net immigration has typically been positive.

Figure 7 also shows a gradual decline in the crude death rate, with some interruptions from the world wars. However, the decline seems very gradual. How could such a gradual decline in the death rate trigger the demographic transition? We need to remember that the chart shows only the crude death rate. It does not show us how those deaths are distributed by age. Therefore it doesn't illustrate the sharp decline in infant mortality, particularly for children under one year old. This is where the major change has occurred. A significant fall in infant mortality can have a major impact on the average age at death, and hence on life expectancy. Figure 8which shows life expectancy at birth, illustrates this. A male born in 1892 could be expected to live to age 54, by 2002 male life expectancy had risen to 77 years. The trend upwards in life expectancy appears to be tapering off, in line with international observations, partially driven by changes in diet and lifestyle.

The charts presented here cover the total population and hence include Māori. However, if we were to look at Māori birth and death rates separately, we would see that the Māori population underwent a relatively swift demographic transition of its own (Pool, 1991). Mortality rates declined markedly in the two decades after the second world war. The birth rate then declined very rapidly in the 1970s. The demographic transition, which was virtually complete by 1986, was accompanied by increasing urbanisation.

Figure 8 Life expectancy at birth

Age in years



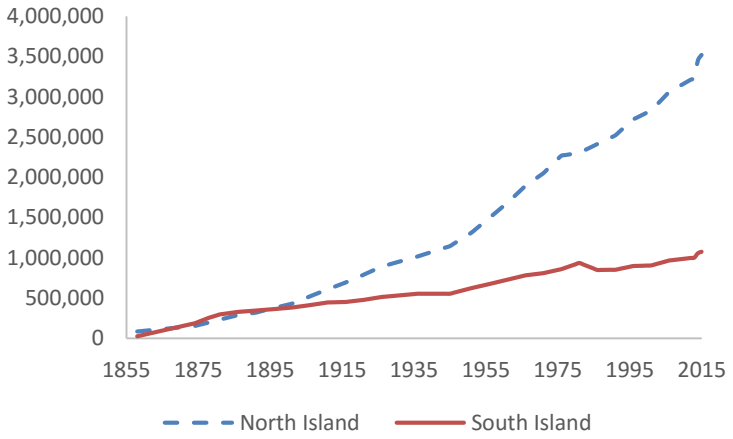
Sources:NZOYB (1998), Statistics New Zealand (2002) *Demographic trends 2001*, *INFOS*

Distribution of population

Figure 9 illustrates what most New Zealanders know: that in the late 19th century the South Island was the 'mainland'. While the North Island had a higher population than the South Island for a brief period after 1840, the South Island soon overtook it. The gold rush was an obvious reason for the stronger growth. Also, the settlements of Dunedin and Christchurch were successful, relative to North Island settlements, with little Māori-pākehā strife. Wool and wheat soon became major agricultural outputs from the south. The North Island population eventually caught up, with the 1901 census revealing that again the north had surpassed the south. Since then, most of the population growth has been in the north.

Figure 9 North Island and South Island populations

Census totals



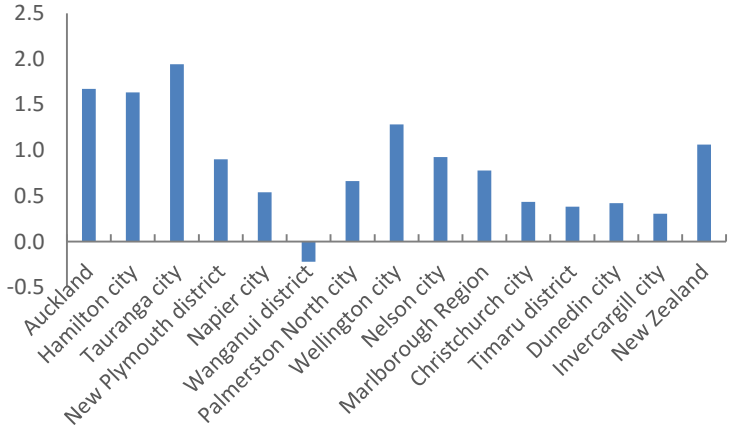
Sources: NZOYB 2000, *2001, 2013 Census final counts, NZ.Stat*

Figure 10 ..Population growth in major urban areas 1886–2001
Compound annual growth rate, percent

gives us another view of population trends. It shows average annual population growth in urban areas from 1886 to 2013. In the chart, the urban areas have been arranged in a north to south order and the stronger growth in the northern urban areas is apparent. Note though that even in the slower-growing urban regions, growth rates are very close to the growth rate of the nation as a whole. This suggests that growth in other areas—that is, in rural areas—has been affecting the national growth rate, and must have been growing at a slower rate than the urban centres.

Figure 10 Population growth in major urban areas 1886–2001

Compound annual growth rate, percent



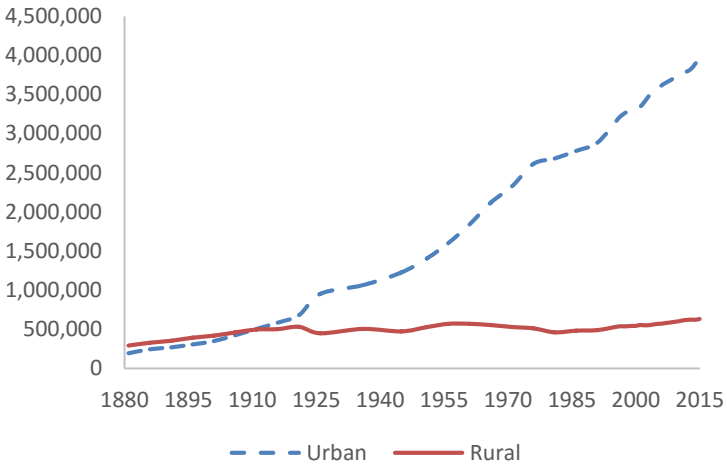
Sources: NZOYB 2000, *2001*, *2013 Census final counts*

Figure 11, following, confirms this, showing that most of the population growth has occurred in urban areas. There are some discontinuities in this graph, with some changes in definitions between the 1921 and 1926 censuses, and also between the 1976 and 1981 censuses.[1] Nevertheless, it seems that the rural population has remained relatively stable, at around half a million, since 1911.

[1] The figures up to 1921 are for the non-Māori population, while later figures are for the total population. Figures up to 1921 show boroughs and cities vs. counties (including town districts); later figures show urban areas and towns with over 1000 population vs. remaining population. From 1981 the figures are for resident population, rather than de facto population.

Figure 11 Urban and rural populations from 1881

Census totals



Sources: NZOYB 2000, *2001, 2013 Census final counts, INFOS*

Labour market

It can be argued that the labour market serves two functions:

- It is a central feature of the production system, where the demand for labour from firms, and government, meets the supply of labour from households. When demand increases by less than supply, we get increasing unemployment. The difference between demand and supply affects the price of labour, that is, wage rates.
- It distributes income between households, affecting their standard of living. The distribution between households can be affected by government, largely through taxation (this taxation can be negative, thereby resulting in income support). Government may also set minimum wage rates. While government can use other measures that affect income, such as social welfare payments, the labour market still determines, to a large extent, who gets what.

In this section we will be focusing on the first function, looking at aggregate measures of employment and wages, and what they tell us about the country's production.

Employment

Figure 12 shows employment by census year from 1896. Censuses have generally been undertaken every five years from the end of nineteenth century. However there were some exceptions:

- The census scheduled for 1931 was cancelled, largely as a money saving response by government during the depression.
- The 1941 census was not held, owing to the second world war.

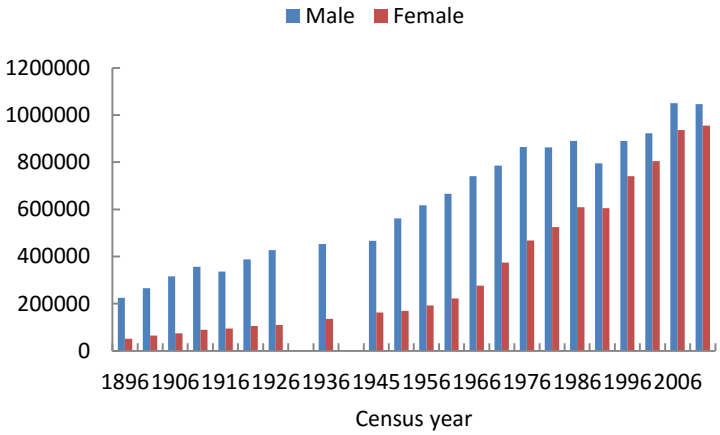
Note too that the mid-1940s census was held in late 1945, rather than in 1946. This was to ensure that the electoral boundaries could be redrawn in time for the election to be held in 1946 (see NZOYB, 2000, p97).

The cancelling of the 1931 census is perhaps the most significant loss, since it leaves us with no reliable estimates of unemployment during the depression (more on this later).

Note that 1896 is the earliest census for which we have data on both employment and unemployment. Prior to 1896, we have labour force figures but these include both the employed and the unemployed and we cannot distinguish between them.

Figure 12 Employment

Full-time employment to 1966, total employment from 1971



Sources: NZOYB(2000), *2001 Census national summary*

Perhaps the most outstanding feature of Figure 12 is the growth in female employment, especially since the mid-1950s. Back in 1896 females accounted for only 18.3 percent of full-time employment. By 2001 women accounted for 46.6 percent of total employment.

Looking at male employment we can see the impact of major events:

- Male employment fell in 1916, with a substantial number of men being away at the battlefields of Europe.
- Employment showed little change between 1926 and 1936, highlighting the effects of the depression. Our GDP estimates, which we looked at earlier, suggest that economic activity bottomed out in the year ending March 1933, then grew strongly as the economy recovered. It is also likely that employment grew

strongly from 1933. Even so, by 1936 it was still not much higher than it had been 10 years earlier.

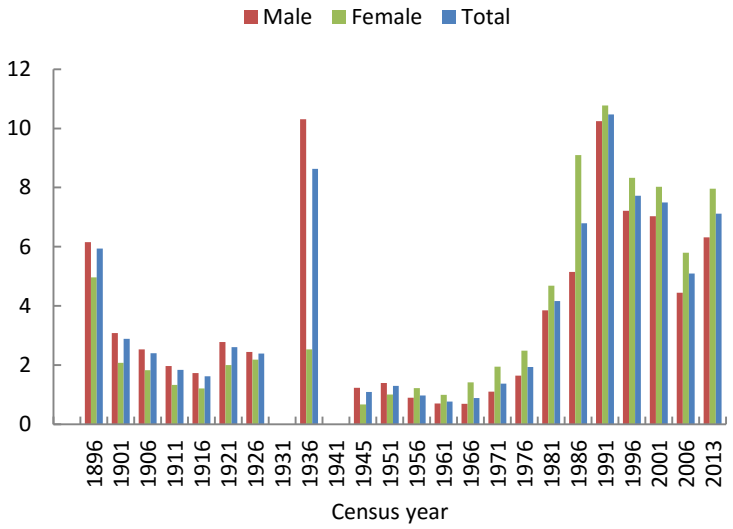
- Male employment climbed strongly through to 1976, then fell back as the effects of the oil shocks took hold.
- There was some increase in employment from 1981 to 1986 but there was a significant decline between 1986 and 1991 as New Zealand felt the impacts of the 1987 share market crash and global recession.

Unemployment

Figure 46 shows unemployment rates for census years.

Figure 13 Unemployment rate

Unemployment as percent of labour force



Sources: NZOYB (2000), *2001 Census national summary*

Five features stand out:

- The decline in the unemployment rate from 1896 through to the beginning of the first world war, as New Zealand prospered from its primary exports to Britain.
- The huge lift in male unemployment in 1936, with the effects of the depression still being evident. We have to be careful here though. Unlike other censuses, the 1936 census included those who were on relief work or subsidised employment in the unemployed category.
- The very low levels of unemployment from 1945 through to 1966.
- The grinding rise in unemployment rates from 1966 through to 1991. Note too that in every census over this period, the female unemployment rate is higher than the male rate.
- A dramatic drop in unemployment heading into the 21st century to levels not seen for over 20 years.

A question that intrigues both historians and economists is: what would the unemployment rate have been in 1931 if the census had not been cancelled? Or what would the rate have been in 1933, in the depths of the depression, had it been measured?

Some administrative data is available from this period, including data on those registered with the government as being unemployed. Macrae and Sinclair (1975) used this data to estimate the unemployment rate. They also had to make assumptions about labour force participation rates in order to estimate the total labour force. Their conclusion was that in mid-1933, just over 81,000 people, or 12.0 percent of the labour force was unemployed. Macrae and Sinclair stressed that their estimate of the unemployment rate could be seen as being a minimum. They note, for example, that many people who were unemployed at that time probably didn't register, partly because of the stigma attached to doing so.

Rankin (1995) critiques Macrae and Sinclair's work and derives his own estimates of unemployment during the early 1930s. He notes a number of errors in Macrae and Sinclair's work and provides a 'corrected' estimate for their unemployment rate for mid-1933 of 13.5 percent. Rankin's own estimates of the unemployment give a much

higher rate—26 percent or more—but his definition of unemployment is broader than that used by Macrae and Sinclair. His definition includes people who are not seeking work but who would take a job if offered one. This definition is similar to that of the 'jobless', as used in the Household Labour Force Survey.

Overall it seems that the unemployment rate in New Zealand during the depression, whilst high, was not as high as in other countries. For example, the rate reached 22.5 percent in the UK in 1932 (Mitchell and Dean, 1962, p67). The US rate went even higher, reaching 24.9 percent in 1933 (Mitchell, 1983, p163).

As we saw earlier, in recent times the highest census rate for unemployment occurred in 1991 when it reached 11.6 percent. This rate was getting close to the rates we last saw back in the 1930s. However, there were some differences:

- The rise in female participation rates since the second world war is reflected in the rise in female unemployment over this period. Back in the 1930s, the female unemployment rate was low, at least relative to that for males. In those days, most women were not in the labour force.
- The incidence of unemployment by age was different. In the 1930s, the overwhelming majority of the unemployed were adult males. (No wonder there were riots!) In the 1980s, as unemployment rose, it was initially the young who were the hardest hit. As firms ceased taking on new staff, school leavers were the ones who couldn't find jobs. (The situation changed in the late 1980s and early 1990s as layoffs resulted in greater numbers of older people becoming unemployed.)
- It seems likely that the stigma of being unemployed in the 1990s was not as great as back in the 1930s. This is consistent with the rise of the concept of citizens' 'economic rights' (more on this in the chapter on government).
- The level of income support for the unemployed was higher in 1991 than in 1936. The level was too generous according to some, who argued that the level of the unemployment benefit was a disincentive to work, and was actually a contributing factor in

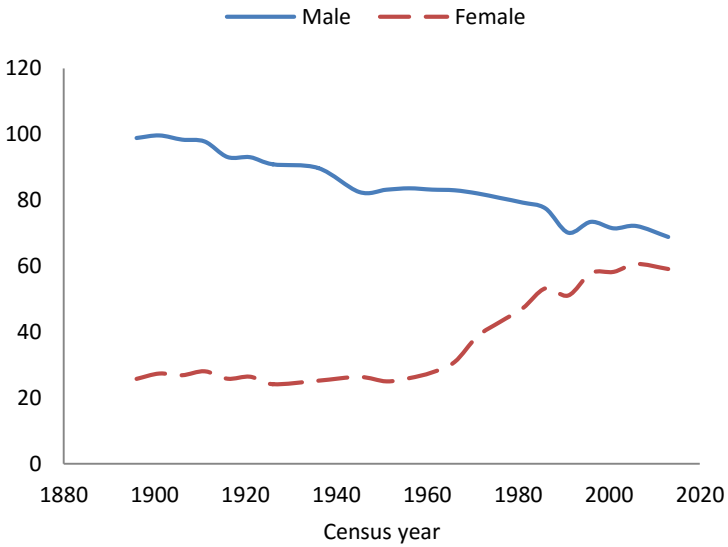
causing high unemployment. The level of the unemployment benefit was cut in mid-1991, several months after the 1991 census.

Participation rates

Participation rates show the proportion of the population that is in the labour force, that is, the proportion that is either in employment or is 'unemployed and seeking work'. Figure 14 shows participation rates since 1896 for both males and females. Each rate is calculated as a proportion of the population aged 15 and over, or what we would now call the 'working age population'.

Figure 14 Participation rates

Labour force as percent of population aged 15 and over



Sources: NZOYB (2000), *2001 Census national summary*

As the chart shows, the male participation rate has declined while the female rate has risen. The general decline in the male rate is usually attributed to younger people staying in education longer and older people retiring earlier. But the decline in 1991 looks particularly large. No doubt the difficult employment situation at the

time had its effect on participation. Many males would have become 'discouraged workers', neither being in employment nor seeking work. The female participation rate was similarly affected in this period.

Note the high male participation rates in the late 1890s and early 1900s, where they are close to 100 percent. Is this realistic? Would nearly all males aged 15 or over have been working at this time? Surely a significant proportion of this group would have been retired, even though pension rates would have been relatively low?

The problem appears to be with our definition of working age population, which is those aged 15 and above. Back in 1896, the school leaving age was 13. It was raised to 14 in 1901 and to 15 in 1944 (NZOYB, 1990, p262). (The leaving age was raised to 16 in 1993.) So for the earlier years of the period, our definition of working age population excludes a proportion of those who would be working. (See NZOYB, 2000, 318–319 for adjusted participation rates for the 1896–1916 period. These were calculated by removing those under the age of 15 who were working from the labour force.)

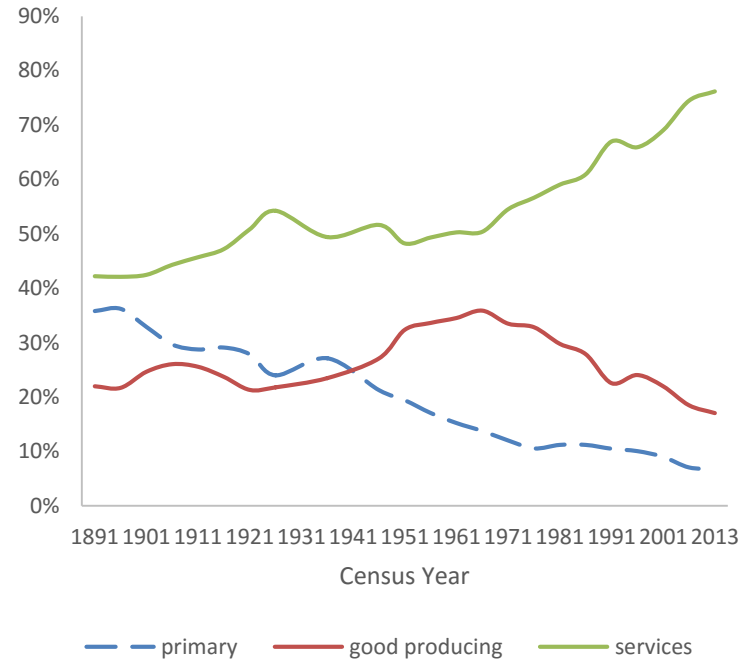
Industry structure

We can use census employment data to look at how New Zealand's industrial structure has changed. Figure 15 shows the percentage of total employment in each of three sectors:

- Primary (agriculture, mining, forestry, fishing)
- Goods producing sector (manufacturing and construction)
- Services.

Figure 15 Employment by industry sector

Percent of total employment



Sources: Census data from Bloomfield (1984), official yearbooks, and *2001 Census national summary*

The main features:

- The primary sector in 1891 accounted for over a third of total employment; it now accounts for 9 percent of all employment. However, the proportion of the labour force employed in primary production in New Zealand is still far higher than in most developed countries.
- The goods producing sector's share of employment increased slowly in the period up to the end of the second world war. It then rose sharply, peaking in 1966. The decline since then has been relatively fast. The sector's share of total employment is now lower than it was back in 1896.

- The service sector's employment share has increased steadily, except during the mid-1930s when it declined before bouncing back. Services now account for over two thirds of all employment.

These changes in employment largely reflect a path of economic development which has been common to many countries. Cameron (1989), 14–16, details this process. In summary:

- Initially societies focus on agriculture, with mere survival requiring them to concentrate on the production of foodstuffs.
- Agricultural productivity begins to rise. Consequently fewer workers are needed for producing subsistence goods, leaving other workers available to undertake other activities. Industrialisation begins, with a greater proportion of the population being involved in manufacturing and construction. Underlying the ongoing shift from agriculture to industry are two factors. On the supply side, increasing productivity in the agricultural sector makes it possible to produce the same output with less labour. On the demand side, we have Engel's law: as a consumer's income increases, the proportion of income spent on food declines. In short, there is a limit to the amount of additional food we want. Increasingly, the demand is for manufactures and houses.
- A second structural change now occurs, with the demand for services replacing the demand for goods. The same story applies: as productivity rises real incomes also rise. But there is a limit to how much consumers will spend on additional goods or houses. A larger proportion of their additional spending is on services and leisure activities.

In essence, this development path reflects the old saying about what the necessities of life are: 'food, shelter, clothing'. First we see the focus on food production, then on housing and textiles. But perhaps we should expand the old saying with the necessities of life now being 'food, shelter, clothing and services'.

Figure 15 indicates how New Zealand has followed this path. We should remember though that the development of the agricultural sector occurred relatively rapidly in New Zealand, especially

compared to Europe. This rapidity was largely due to the holus-bolus importation during the 1800s of Victorian England's agricultural technology. We had a flying start.

The expansion of service sector employment and the relative decline of the other two sectors can be expected to continue. However we should be careful not to think that all jobs in the service sector are 'white collar' jobs. The service sector includes truck drivers, repair workers, hairdressers and many other non-desk type jobs. Similarly, not all jobs in the primary and goods producing sectors will be blue collar jobs. An increasing proportion of jobs in these sectors will involve information processing, process control, and other analytical and managing tasks.

Household Labour Force Survey

The Household Labour Force Survey (HLFS) is undertaken by Statistics New Zealand. It was begun in the March quarter of 1986, although results are also available from the pilot survey undertaken in December quarter 1985. The HLFS concepts of the labour force and unemployed are broadly in line with International Labour Organisation (ILO) definitions and the HLFS unemployment rate can be readily compared with overseas rates. The HLFS unemployment rate soon became accepted as the 'official' measure of unemployment. Prior to the introduction of the HLFS, the unemployment rate had been calculated using the registered unemployment figures, that is, the number of people who were registered with the Department of Labour.

The concept of unemployment as used in the HLFS can be summed up as 'unemployed and actively seeking work' with some accent being on the word 'actively'. The HLFS unemployment figures generally include those people who, in the immediate period before they were surveyed, made contact with an employer or an employment agency. Not included in the figures are those who simply looked at job ads in the newspaper, or those who haven't been looking for a job but would take a job if one was offered to them. The HLFS definition of 'unemployed' is close to that used in most censuses (the 1936 census being a notable exception) but with a little

more emphasis on including only those who are 'active' in looking for a job.

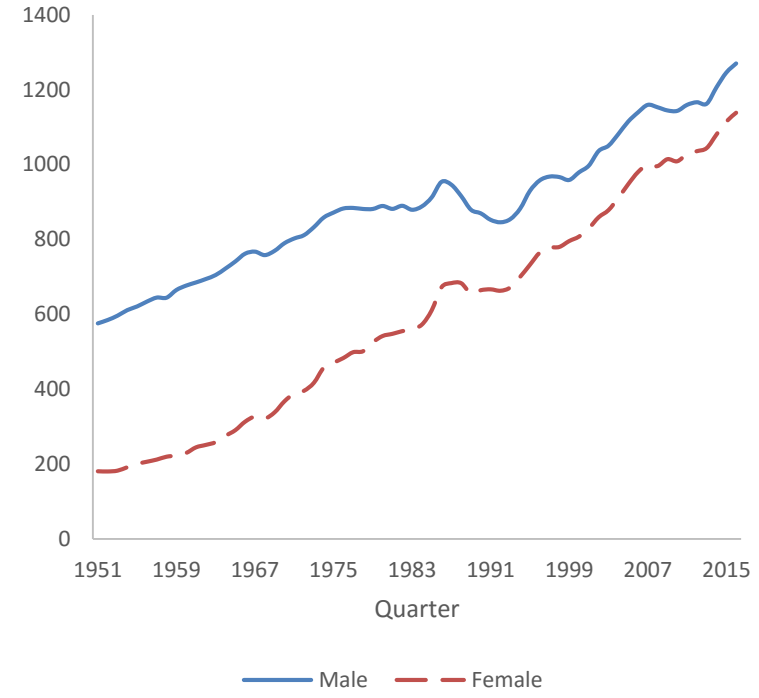
With the HLFS becoming the new benchmark for both employment and unemployment numbers, economists have looked back at the past wondering what the HLFS figures would have been if the survey had been implemented earlier. There have been a few attempts at backdating the HLFS, making estimates of employment and unemployment on an HLFS basis for earlier periods.

Chapple (1994) produced estimates for both male and female persons employed (full-time and part-time) and the unemployed back to the 1950s. He based his employment estimates on earlier surveys undertaken by the Department of Labour—the half yearly employment survey and the quarterly employment survey. Unemployment estimates were derived using registered unemployment data.

Figure 16 shows persons employed, both estimated and actual for males and females. These are quarterly figures, and perhaps the first thing to note is the seasonal variation. All of the other data we have looked at has been annual data so we have not seen the seasonal fluctuations that occur quarter to quarter. If we look at the HLFS over a year we find that employment reaches a low point in the September quarter, the winter quarter. It then rises sharply in the December quarter as seasonal harvesting begins, students become available for part-time work, and Christmas boosts activity in the retail sector. Employment falls in the March quarter, then again in the June quarter, and gets back to a seasonal low in the September quarter. Note that we are talking here about *regular* seasonal patterns. These patterns can be sometimes be difficult to see without undertaking statistical analysis since quarterly changes in employment are also affected by the underlying growth in employment.

Figure 16 HLFS persons employed

Thousands



Sources: Chapple (1994), INFOS

This underlying growth in employment is positively correlated with the level of economic activity. As a rule of thumb, employment growth follows growth in real GDP with a lag of one to two quarters, that is, three to six months.

The growth of male and female employment in Figure 16 is similar to that in Figure 12, which showed census employment. This is not surprising, since the questions asked in the HLFS are very similar to the labour market questions asked in the census. In fact, the census data on employment is used as a 'benchmark' for the HLFS; HLFS results are adjusted, where necessary, to ensure that

they are generally consistent with census data. While we only get census data at five-yearly intervals, it provides a good cross check on HLFS data, which is based on a sample of households rather than a full census.

The HLFS is mightily useful in that it 'fills in the holes' between censuses. Figure 16 shows that between the 1986 and 1991 censuses male employment held up for a while but then fell sharply after the 1987 sharemarket crash. In fact it wasn't until 1993 that male employment turned up. Female employment showed a similar pattern although the decline after the sharemarket crash was less severe.

Figure 17 shows the unemployment rate, on an HLFS basis, since 1956. The climb in the rate from the mid-1970s through to the early 1990s is remarkable. The oil shocks of 1973 and 1979 clearly had a strong impact on the rate. It continued to rise again in the aftermath of the wage and price freeze in the early 1980s, then began to fall as the economy boomed. But worse was to come, with the combined effects of deregulation, restructuring, the sharemarket crash, and world recession pushing the unemployment rate to a high of 11.0 percent in early 1992.

Unemployment fell sharply from 1993 as the economy grew strongly. It stayed at around 6 percent for a while, prompting some economists to state that this was now the economy's 'natural rate' of unemployment, and we would never get below it. This view tended to be reinforced when unemployment began to rise again as the Asian crisis hit. Getting below 6 percent was unattainable, some said. But as Figure 17 shows, the unemployment rate did go below 6 percent in 2001, and dipped below 4 percent for much of the period 2004 to 2007. And while inflation did increase slightly in this period, there seemed little danger of inflation staying above the 3 percent upper limit of the Reserve Bank's target range for long.

But the big question is: why was the unemployment rate so benign until the 1970s, when it then began to explode?

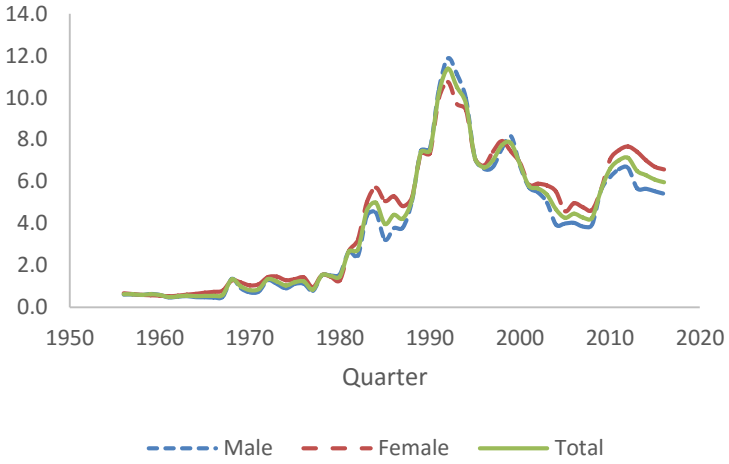
Chapple (1996) examines this issue in detail. He looks at a number of hypotheses as to why unemployment rose, including the following:

- That the labour force grew more strongly in the 1970s as 'baby boomers' began to enter the job market, resulting in labour supply outstripping demand.
- That the unemployment benefit system was increasingly generous, resulting in workers becoming more choosy about taking jobs.
- That there was an increasing mismatch between workers' skills and the skills that employers required.

In the end, Chapple thinks that these explanations are inadequate. He suggests that a critical factor behind the sharp rise in unemployment was "the contraction in aggregate demand engineered to reduce New Zealand's inflation rate from about 18 percent in the mid-1980s to almost zero by 1992" (p112).

Figure 17 HLFS unemployment rate

Unemployed as percent of labour force



Sources: Chapple (1994), INFOS

My view is that the rise in unemployment was partly due to historical events, including external shocks. Looking at Figure 17, it seems hard to conclude otherwise. To recap, these events included:

- The oil shocks of the 1970s, and the government's subsequent reaction to them. In retrospect, 'Think Big' was never the right option.
- The sharemarket crash of 1987. This highlighted the fragile state of the financial and property development sectors. It also highlighted the inadequacy of the centralised wage fixing system. Immediately after the sharemarket crash, wage agreements continued to be settled with wage rises similar to those settled on before the crash.
- The effects of deregulation and privatisation, with the drive for economic efficiency in both the private and public sectors resulting in markedly lower labour requirements.
- The world recession of the early 1990s.

Underlying all this though was the structural problem with the New Zealand economy: the rate of world growth in agricultural exports was not matching world growth in manufactured exports (Briggs *et al*, 2001). As a result, our trend rate of economic growth simply didn't match that of the rest of the OECD and unemployment moved up a level; the days of 2 percent unemployment rates—the years of the 'long expansion'—were gone.

Wages

Figure 18 shows an index of nominal wages. This has been assembled by stitching together data from a number of sources:

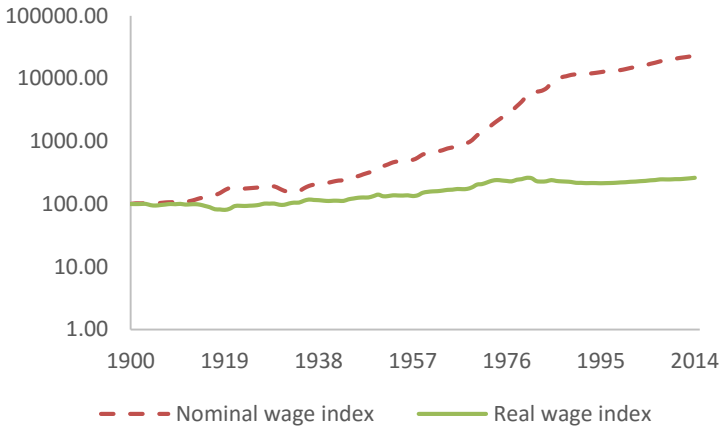
- An index of minimum wage rates for 1901–1919 as derived by Clinkard (1919).
- Nominal weekly wage rate indexes for adult males prepared by Statistics New Zealand. These began in 1914.
- The Department of Labour's half yearly employment survey which ran from 1957 and the Department of Labour's quarterly employment survey, which began in 1980. The series used were ordinary time hourly rates for all people (that is, males and females) in all industries.

- Statistics New Zealand's quarterly employment survey which began in 1989. Again the series used was ordinary time hourly rates for all people in all industries.

The resulting index has been based on 1901 = 100. A real wage index was derived by dividing the nominal wage index by the CPI and again setting the 1901 value equal to 100.

Figure 18 Wage rate indexes, nominal and real

Indexes, 1901=100, logarithmic scale



Sources: Official yearbooks, INFOS

Figure 18 uses a log scale so that we can see the changes in both indexes on the same chart.

Let's look at some of the features of these series:

- The nominal index climbs strongly from around 1910 to 1920. However, real wages decline over this period. Despite strong wage growth during the war, prices grew even faster.
- Both nominal and real wages showed steady growth throughout most of the 1920s.
- Nominal wages fell sharply during the depression, but real wages showed little change. Falls in wages were, in the main, offset by falls in consumer prices. Provided a person had a job during the

depression—and as we have seen, many didn't—life may have been okay.

- Both nominal wages and real wages showed fairly constant growth over the 'long expansion' period, from the mid-1930s to the late 1960s.
- Nominal wages rose sharply during the 1970s. Despite high inflation, real wages also showed some growth in this period.
- The wage/price freeze of the early 1980s slowed nominal wage growth and resulted in declines in real wages.
- Nominal wage growth was high through the rest of the 1980s but eased back in the 1990s as inflation came down to low levels. Real wage growth since the mid-1980s has been steady but unspectacular.

Our nominal wage index in 2005 is 170 times higher than it was in 1901. In contrast the real wage index in 2005 is only 2.5 times higher than in 1901. Growth in real wage rates averaged only 0.95 percent per annum over this period.

How did this compare with labour productivity growth? A general rule of thumb that is often used when producing long-term projections is that real wage growth will be in line with productivity growth. Can we test this?

We can use our real GDP estimates and our census employment figures to calculate real GDP per employee, at least for census years. Figure 19 shows such estimates. As with the wage series, the productivity series has been rebased as an index with the 1901 value equal to 100.

As Figure 19 shows, productivity growth over the last century has been higher than real wage growth. Annual productivity growth over this period averaged 1.3 percent per annum. This figure should be regarded as a rough estimate only. We should remember that our real GDP figures for the period to 1955 are unofficial estimates. Also, our employment figures up to 1966 are not for total employment but for full-time employees only. Ideally we would want to use hours worked as the denominator in our productivity measure.

According to our figures, the gap between productivity and real wages opens up in the first decades of the century, then widens further between 1931 and 1945. The gap then closes up a bit in the period through to 1981 before opening up further.

Figure 19 Labour productivity and real wages from 1901

Indexes, 1901=100

Sources: Labour productivity is calculated from real GDP estimates (see **Error! Reference source not found.** for sources) and census data for employment (see Figure 12 for sources). Real wage sources are as for Figure 18.

Table 3 shows average annual change in real wages and productivity for our usual time periods (or as close as we can get to them using census data). The productivity figures are generally in line with our views of how the economy fared in each of these periods, that is, there are no surprises.

Table 3 Growth in productivity and real wages

Average annual growth rate, percent change

Period	Labour productivity	Average real wage rate
1901–1916	1.9	-0.5
1916–1936	0.7	1.0
1936–1966	2.4	1.4
1966–2006	0.9	0.9
2006-2013	1.3	0.9

Sources: See Figure 19

So where is the problem—why is real wage growth so much less than productivity growth, especially in the first half of the century? Note that this low wage growth suggests that wage payments as a proportion of nominal GDP declined significantly over the period. While we would expect some short term fluctuations in labour's share of total GDP, a sustained fall, as suggested by our figures, looks implausible.

The most convincing explanation I can come up with for the gap between productivity growth and real wage growth is that our series for nominal wages, upon which our real wage estimates are based, is underestimating actual wage growth. If we go back to page 38 we will see that our wage series for the earliest period, 1901–1919, was for minimum wage rates. It seems likely that the growth in actual wage rates over this period was higher than the growth in minimum wage rates. But I haven't as yet got to the bottom of why the gap between productivity and average wages opened up so much between 1936 and 1945.

An exercise

Will the unemployment rate ever get down to the levels it was at in the 1960s, or even to the levels of the 1970s? If not, why not? What would be needed to lower the unemployment rate significantly from its present level?