Labour Force Participation and GDP in New Zealand

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Abstract

New Zealand's participation rates are high relative to the OECD, and similar OECD countries. However, there is scope for increasing participation, particularly among young women. Increases in labour force participation could make a contribution towards closing the income gap between New Zealand and wealthier OECD countries. In this paper we calculate the effect on GDP of hypothetical increases in employment from increased participation, taking into account the differences in productivity between new and existing workers. The results suggest that increasing the labour force participation of women aged 25-34 to the average, adjusted for paid maternity leave, of the top 5 OECD nations increases employment by 28,800 and generates an additional $1,215million of GDP, making GDP 1.0% higher than it actually was in the baseline year 2001. Raising participation overall to the average of the top 5 OECD countries increases employment by 142,600 and generates additional $6,101 million of GDP, an increase of 5.1% more than it would otherwise have been.

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J24 - Human Capital Formation; Occupational Choice; Labour Productivity
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KEYWORDS Labour force participation; female labour force participation; New Zealand; productivity

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1 Introduction

Although New Zealand per capita GDP growth has increased since the early 1990s, New Zealand's per capita GDP is still below the OECD average. In 2001 New Zealand per capita GDP was about 84% of total OECD per capita GDP (The Treasury 2004). From a growth accounting perspective, improvements in per capita GDP can arise from increases in labour productivity and from labour utilisation, and therefore from increases in labour participation. The purpose of this paper is to evaluate the potential for further increases in labour participation to contribute to raising New Zealand per capita GDP and closing the gap between New Zealand and OECD per capita GDP.

The paper contributes to two ongoing policy debates in New Zealand that involve claims about the effect of increased labour force participation on GDP. The first debate concerns family policy. The claim is that measures such as free childcare that raise employment rates of young women could generate substantial increases in GDP. The second debate concerns broader economic strategy. The claim, made by commentators such as the OECD (2003a: 17), is that general increases in labour force participation could make a substantial contribution towards closing the income gap between New Zealand and wealthier OECD countries.[1]

Labour force participation measures the proportion of the population over 15 years of age who are either working (employed) or without paid work and actively seeking work (unemployed). Increased participation could affect GDP by increasing employment.

This paper investigates the plausibility of these claims by calculating the effect on GDP of hypothetical increases in participation. Increases in GDP can be expressed as the product of GDP per extra employee and the increase in employment. The paper derives values for "increase in employment" and "GDP per extra employee", and then calculates

[1] The OECD (2003b: 53) suggests that labour utilisation (employment rates combined with hours worked) is an important factor in accounting for differences in the GDP per capita levels across countries, whereas the age composition of the population plays a very minor role.

> "Most of the OECD countries that experienced an acceleration in GDP per capita growth also recorded an increase in labour utilisation, while most of those where employment stagnated, or even declined, saw a deterioration in their growth performance. This is because in these countries, labour productivity growth has not been able to offset the negative contribution to growth coming from poor employment performance. Furthermore, in most countries the up-skilling of the workforce played a significant role in boosting labour productivity but, in those with poor employment performance, this was partially due to the fact that the-low skilled were kept out of work."

the associated "increase in GDP". We investigate what GDP would have been in 2001 if, instead of the actual participation rates, we had experienced a different, higher, set of rates. There are many ways to carry out such an exercise, involving varying tradeoffs between realism, tractability, and transparency. We have chosen methods that sacrifice some realism in return for a relatively high degree of tractability and transparency.

We have adopted a much simpler strategy. We set up hypothetical scenarios, based on New Zealand's historical participation trends and on the experiences of comparable OECD countries. In the first scenario, which we call the "young women" scenario; participation rates for women aged 25-34 equal an "adjusted" average for the five countries, from a sample of 24 OECD countries, with the highest rates. The adjustment, which is described in more detail in Appendix 4, attempts to correct for the fact that most OECD countries, including New Zealand, include women on paid maternity leave in their labour force statistics. This scenario addresses the claim that policies to raise participation rates of young women have substantial growth pay-offs. In the second scenario, which we call the "overall" scenario; participation rates for the working-age population as a whole equal the average across the five countries in our sample with the highest rates. This scenario addresses the claim that higher participation overall could raise New Zealand's income relative to other OECD countries.

Estimates of GDP per extra employee should allow for the possibility that the new employees work different hours, and have different productivity, from existing employees. The estimates should ideally incorporate factors such as learning on the job, the effect of taxes used to fund employment policies, and changes in the ratio between capital and labour. They should also allow for measurement artefacts: typically, some of the measured increase in GDP that occurs when employment rates increase simply reflects activities moving out of unmeasured home production (parents looking after children at home) into measured market production (childcare workers looking after children at crèches) (Waring 1988).

We do some of the things on this list. We allow for different hours and productivity, and we calculate the extra capital required to maintain constant capital to labour ratios. Our analysis of tax, learning on the job, and measurement artefacts is, however, confined to a few comments in Section 5.

The next section of the paper compares trends in New Zealand employment rates with trends across the OECD. Section 3 explains how we generate our scenarios and our assumptions about hours and productivity. Section 4 presents the results for the effects on GDP. The final section summarises the conclusions and discusses policy implications.

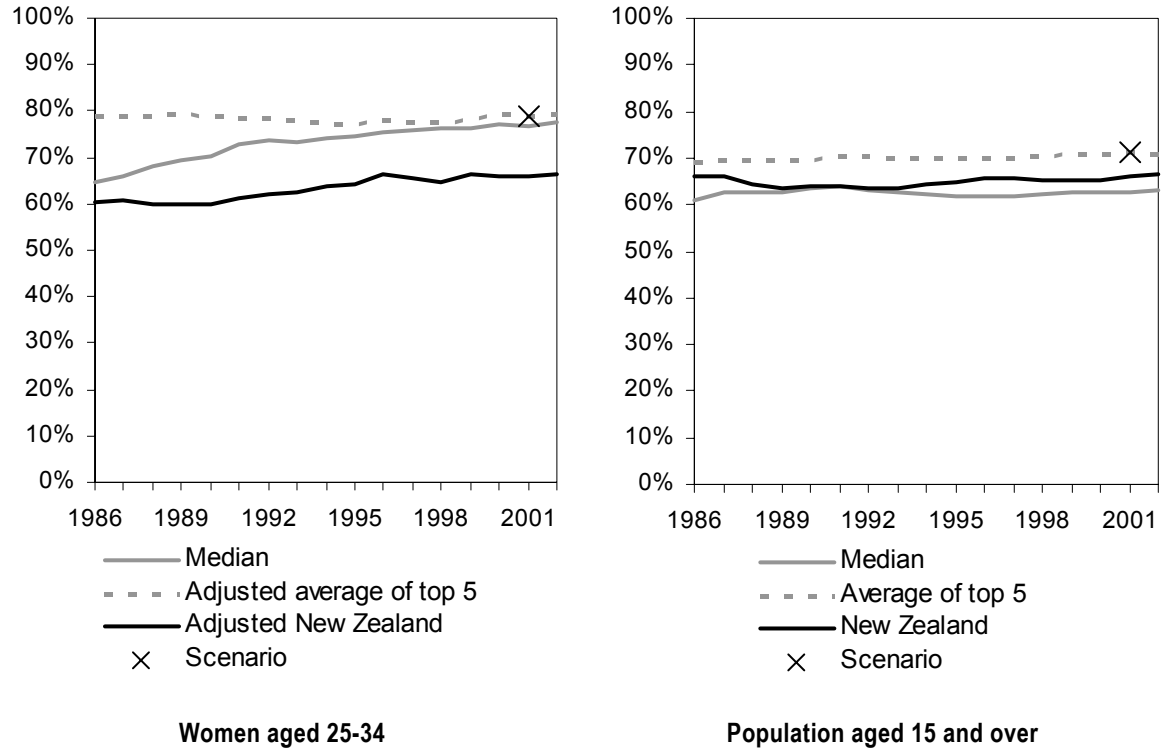
2 International comparison of labour force participation rates

In this section, we compare New Zealand's labour force participation rates with those of a selection of similar OECD countries. The selection of countries is identical to that used by the Australian Commonwealth Treasury in a similar investigation of participation and GDP (Gruen and Garbutt 2003: 3). Korea, Mexico, the Slovak Republic, and Turkey are excluded on the grounds that government social expenditures are very low, resulting in much stronger incentives to remain in work in older ages. Hungary is also excluded

because it lacks data on social expenditures, and Luxembourg because its employment data appear to include non-residents. This leaves 24 countries.[2]

Figure 1 shows trends in New Zealand's labour force participation rates, and indicates how these compare with other countries in our sample. As can be seen in the left panel, the rate for New Zealand women aged 25-34 has been relatively low since the late 1980s. In 2001 it was well under the median rate for countries in our sample. While the New Zealand data has been adjusted for paid maternity leave (see Appendix 4) and the OECD median has not, even the unadjusted New Zealand data falls well below the median. The New Zealand data is also nearly 13 points below the average rate for the 5 countries with the highest participation rates for women aged 25-34, after they have been adjusted for paid maternity leave. In contrast, New Zealand's "overall" participation rate, for the whole population aged 15 or more, has been relatively high. The participation rates for 2001 implied by the scenarios described in the next section are marked with an X.

Figure 1 – Labour force participation rates, females aged 25-34, and population aged 15 and over



Notes – The sample of OECD countries excludes the following: Hungary, Korea, Luxembourg, Mexico, the Slovak Republic, and Turkey. Participation rates are defined as the percent of people in a given age group who work or are actively looking for work.

Source – Calculated from data in the OECD *Labour Market Data* online database.

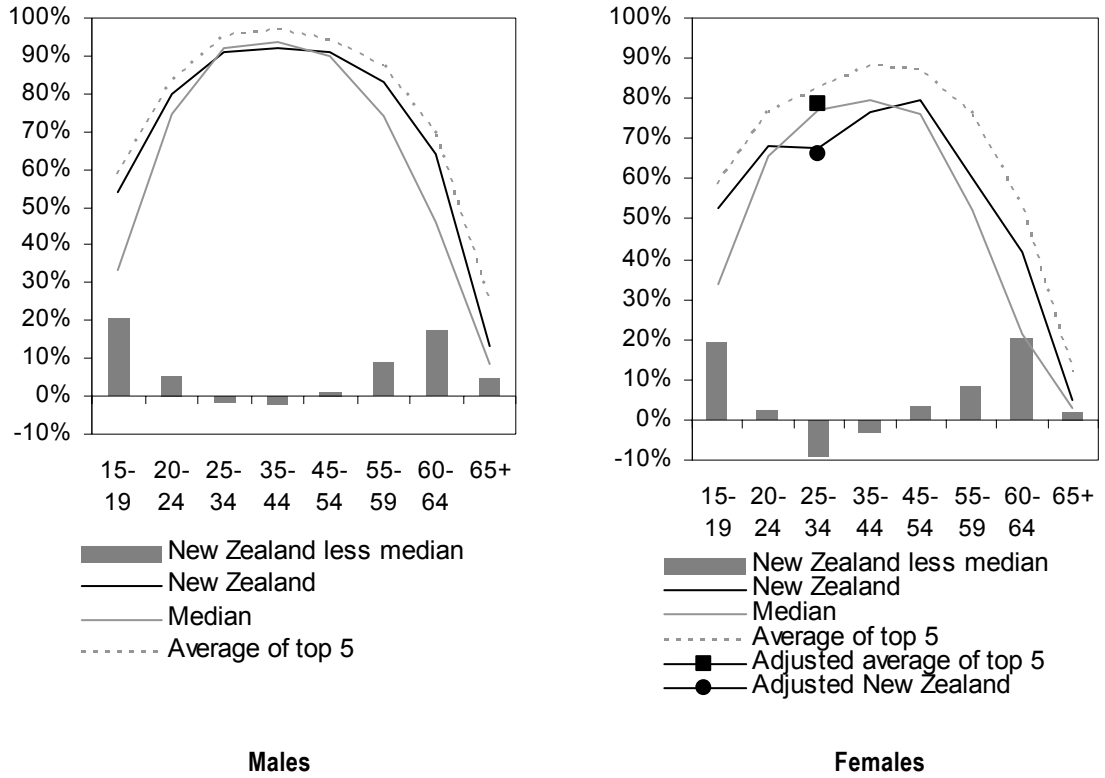
Figure 2 provides more detail on age-specific participation rates in 2001. The data used to construct the figure, plus comparable data on employment and unemployment rates, are given in Appendix Tables 1 and 2. As can be seen in Figure 2, participation rates for New Zealand males are similar to the sample medians in the middle age groups, but are relatively high in the youngest and oldest age groups. The pattern for New Zealand

[2] The countries are Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Poland, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and the United States.

females is similar, except that—consistent with Figure 1—the rate for females aged 25-34 is relatively low.

The participation rates for young women are different from those of other groups for a number of reasons. Women, particularly those that are highly skilled, are likely to enter the workforce and work full-time through their twenties before family responsibilities and motherhood appear to encourage many to work only part-time. Although participation rates recover for women over forty, there seems to remain a preference for part-time work. This broad pattern is consistent with the observation of Jaumotte (2003: 20) that New Zealand is one of a group of OECD countries with below-average public childcare spending and above-average part-time female employment.

Figure 2 – Labour force participation rates, 2001



Source – Calculated from data in the OECD *Labour Market Data* online database.

At all ages, females with no qualifications have the lowest participation rate, although it increases steadily with age until 45-59 years old and then declines. In general, women with tertiary qualifications have higher participation rates, although the effect is confounded for young women, presumably as a result of participation in education (although, it should be noted that few in the 15 to 19 age group have finished a degree). Women with post compulsory schooling qualifications all exhibit a dip in participation, presumably associated with childbearing, and the dip occurs at later ages for those with higher qualifications. This pattern is likely to reflect the opportunity cost of childbearing for these women.

3 Modelling the effect of increased labour force participation on GDP

3.1 Labour force participation scenarios

In this section we develop two scenarios of increased labour force participation. The scenarios do not represent policy targets, but rather are used simply to illustrate the potential magnitude of the effects of increased participation on GDP.

We generate a "young women" scenario, representing an increase in labour force participation among women aged 25-34, and an "overall" scenario, representing an increase in participation across the whole population aged 15 and over. We choose our scenarios by looking at participation rates in the OECD sample, which show what comparable countries have achieved, and at New Zealand's actual rates.

To generate the "young women" scenario, we set the participation rate for women aged 25-34 equal to the adjusted average rate (see Appendix 4) for the five OECD countries with the highest rates, and leave other rates unchanged. The actual 2001 rate for New Zealand women aged 25-34 was only 67.8%, while the adjusted average of the top five was 78.8%, so the "young women" scenario entails an increase of 11 points.

New Zealand's labour force participation rate for all people aged 15 and over was already a relatively high 66.0% in 2001. To obtain an equivalent "overall" scenario to the "young women" scenario, we set the overall rate equal to the average of the top 5 countries in the sample, which is 71.1%. To calculate GDP per employee for this scenario, we also need employment rates for individual age groups. We derive the age-specific rates by adding 5.1% to each of the actual rates. (The figure of 5.1% comes from subtracting the actual overall rate from the target overall rate.) Table 1 shows the actual and hypothetical rates.

Table 1 – Labour force participation rates

	New Zealand 2001		"Overall" scenario	
	Males	Females	Males	Females
15 to 19	54.1%	52.9%	59.2%	58.1%
20 to 24	80.0%	68.0%	85.2%	73.2%
25 to 34	90.9%	67.8%	96.0%	72.9%
35 to 44	91.9%	76.6%	97.0%	81.8%
45 to 54	91.1%	79.4%	96.2%	84.6%
55 to 59	83.0%	60.4%	88.1%	65.5%
60 to 64	63.8%	41.7%	69.0%	46.8%
65+	13.4%	4.8%	18.6%	9.9%

Source – Calculated from data in the OECD *Labour Market Indicators* online database.

The number of actual labour market participants, and the number of extra participants implied by the hypothetical sets of rates, depends on the population in each age group. Table 2 shows actual participants in 2001, and the extra participants under the two scenarios.

Table 2 – Actual labour force participants in 2001, and extra participants implied by the "young women" and "overall" scenarios (thousands)

	Actual participants		Extra participants implied by "young women" scenario		Extra participants implied by "overall" scenario	
Age group	Males	Females	Males	Females	Males	Females
15 to 19	77.0	71.1	0.0	0.0	7.3	6.9
20 to 24	105.0	85.4	0.0	0.0	6.7	6.4
25 to 34	230.5	186.7	0.0	30.3	13.0	14.1
35 to 44	261.6	232.0	0.0	0.0	14.6	15.6
45 to 54	224.8	199.8	0.0	0.0	12.7	12.9
55 to 59	76.5	56.2	0.0	0.0	4.7	4.8
60 to 64	49.1	33.0	0.0	0.0	3.9	4.1
65+	25.8	11.3	0.0	0.0	9.9	12.2
Total	1,050.3	875.5	0.0	30.3	72.9	77.0

Source – Calculated from data in the OECD *Labour Market Indicators* online database.

3.2 New employees

Some of the extra labour force participants will not contribute to GDP because they are unemployed. Table 3 shows unemployment rates for New Zealand in 2001. We assume that the extra labour force participants experience these rates. The ensuing numbers of extra employees are shown in Table 4.

Table 3 – Unemployment rates, New Zealand 2001

Age group	Males	Females
15 to 19	16.2%	14.9%
20 to 24	9.0%	8.7%
25 to 34	4.7%	5.0%
35 to 44	4.1%	4.1%
45 to 54	3.2%	3.3%
55 to 59	4.2%	3.0%
60 to 64	3.7%	0.0%

Source – Calculated from data in the OECD *Labour Market Data* online database.

Note – The unemployment rate is defined as the number of people who are unemployed divided by the number of people who are in the labour force.

Table 4 – Extra employees implied by the "young women" and "overall" scenarios (thousands)

	Extra employees implied by "young women" scenario		Extra employees implied by "overall" scenario	
Age group	Males	Females	Males	Females
15 to 19	0.0	0.0	6.1	5.9
20 to 24	0.0	0.0	6.1	5.9
25 to 34	0.0	28.8	12.4	13.4
35 to 44	0.0	0.0	14.0	14.9
45 to 54	0.0	0.0	12.3	12.5
55 to 59	0.0	0.0	4.5	4.6
60 to 64	0.0	0.0	3.8	4.1
65+	0.0	0.0	9.9	12.2
Total	0.0	28.8	69.2	73.5

3.3 The hours and productivity of the new employees

To calculate the extra GDP generated by the new employees, it is necessary to make assumptions about the number of hours these new employees work, and their output per hour (ie their productivity). The simplest assumption, and one that is often used, is that new employees have the same average hours and productivity as existing workers.

It would be preferable to avoid this assumption. Survey evidence shows that people who are not currently employed differ systematically from people who are currently employed, in ways that affect hours and productivity. An analysis of data from New Zealand's Household Economic Survey shows, for instance, that people who are not currently employed are more likely to have young children, and less likely to have an advanced education, than people who are employed (Kalb and Scutella 2003: Table 1).

The only information on the new employees that is contained in our scenarios is the employees' age and sex. However, even this limited information allows us to make some allowance for differences in hours worked and productivity between new and existing employees.

Table 5 shows estimates of hours worked and wages for the different age groups in New Zealand in the period 1991-2001. These estimates were calculated by Guyonne Kalb and Rosanna Scuttella, based on data from Household Economic Surveys (Kalb and Scutella 2003). As well as calculating hours and wages for people actually in employment, Kalb and Scuttella used data on the background characteristics of people not in employment to predict the wages that they would have earned if they had, in fact, been employed. The background characteristics included such things as sex, age, number of children, marital status, education, and ethnicity.

Table 5 – Estimates of hours worked and wages, New Zealand 1991-2001

	Hours worked by people in employment		Hourly wages for people in employment		Imputed hourly wages for people not in employment	
Age group	Males	Females	Males	Females	Males	Females
15 to 19	28.4	21.2	$9.35	$9.79	$7.86	$8.76
20 to 24	41.3	34.6	$13.43	$12.31	$9.51	$10.64
25 to 34	46.2	35.6	$17.27	$15.69	$11.87	$12.05
35 to 44	47.5	33.0	$20.00	$16.46	$13.17	$12.38
45 to 54	47.7	35.6	$20.55	$15.01	$13.08	$11.76
55 to 59	46.0	33.5	$18.61	$15.55	$12.80	$11.28
60 to 64	42.5	30.4	$16.91	$16.69	$12.06	$10.79
65+	32.6	23.7	$16.91*	$16.69*	$12.06*	$10.79*

*In the absence of data on the wages of people aged 65 and over, we assume that they are equal to the wages of people aged 60-64.

Source – Unpublished tabulations provided by Guyonne Kalb, based on the study described in Kalb and Scutella (2003)

We adopt the standard assumption that output is proportional to wages.[3] Given data on employment numbers, population, and GDP in 2001, it is then possible to calculate GDP per hour worked for people in employment, and imputed GDP per hour worked for people not in employment. Appendix 2 describes the calculations in detail, and Table 6 shows the results.

[3] Whilst it seems likely that wage differentials between age-sex groups reflect more than differentials in marginal products alone, wages still seem to provide the best indicator of relative marginal productivities. Hellerstein, Neumark and Troske, (1999) conclude for the United States that the higher pay of prime-aged and to a lesser extent older workers is accompanied by higher estimates of marginal products whilst the lower wages of women were not accompanied by lower marginal products. However, Crépon, Deniau and Pérez-Duarte (2002) find essentially the opposite for France.

Table 6 – GDP per hour for existing and new employees

	Existing employees		New employees	
Age group	Males	Females	Males	Females
15 to 19	$17.68	$18.51	$14.86	$16.56
20 to 24	$25.39	$23.27	$17.98	$20.12
25 to 34	$32.65	$29.66	$22.44	$22.78
35 to 44	$37.81	$31.12	$24.90	$23.41
45 to 54	$38.85	$28.38	$24.73	$22.23
55 to 59	$35.19	$29.40	$24.20	$21.33
60 to 64	$31.97	$31.56	$22.80	$20.40
65+	$31.97	$31.56	$22.80	$20.40

3.4 The extra GDP generated by the new employees

Table 7 shows the extra GDP generated by the new employees under the two scenarios. The results for each age group and sex are calculated by multiplying together the number of new employees of that age and sex, as shown in Table 4; the number of hours worked per week by people of that age and sex, as shown in Table 5; the number of weeks in a year (ie 52), and the imputed GDP per hour of new employees of that age and sex, as shown in Table 6.

Table 7 – Extra GDP generated by the new employees under the "young women" and "overall" scenarios

	"Young women" scenario		"Overall" scenario	
Age group	Males $m	Females $m	Males $m	Females $m
15 to 19	0	0	134	107
20 to 24	0	0	237	213
25 to 34	0	1,215	669	567
35 to 44	0	0	863	599
45 to 54	0	0	752	514
55 to 59	0	0	263	172
60 to 64	0	0	192	131
65+	0	0	381	306
Total	1,215		6,101	

Under the "young women" scenario, the new employees generate an additional $1,215 million of GDP; under the "overall" scenario, they generate an additional $6,101 million. Actual GDP in 2001 was $120,509 million (Statistics New Zealand series SNCQ.S1NB15). This means that GDP is 1.0% higher than it would otherwise have been in the "young women" scenario and 5.1% higher in the "overall" scenario.

It should be noted that the changes offer a one-off increase in economic activity, rather than an increase in the growth rate. In addition, while increased participation leads to a higher level of economic activity, it might not necessarily increase economic welfare, since participation has opportunity costs.

Each new worker needs a concomitant quantity of capital in order to maintain a constant level of productivity. If the current stock of capital was underutilised, capital utilisation could be increased. Alternatively, if the current stock of capital was fully utilised, new investment would be needed in order to maintain the capital: labour ratio. To maintain a constant ratio of capital to hours worked, the capital stock would need to rise by the same proportion as the increase in participation.

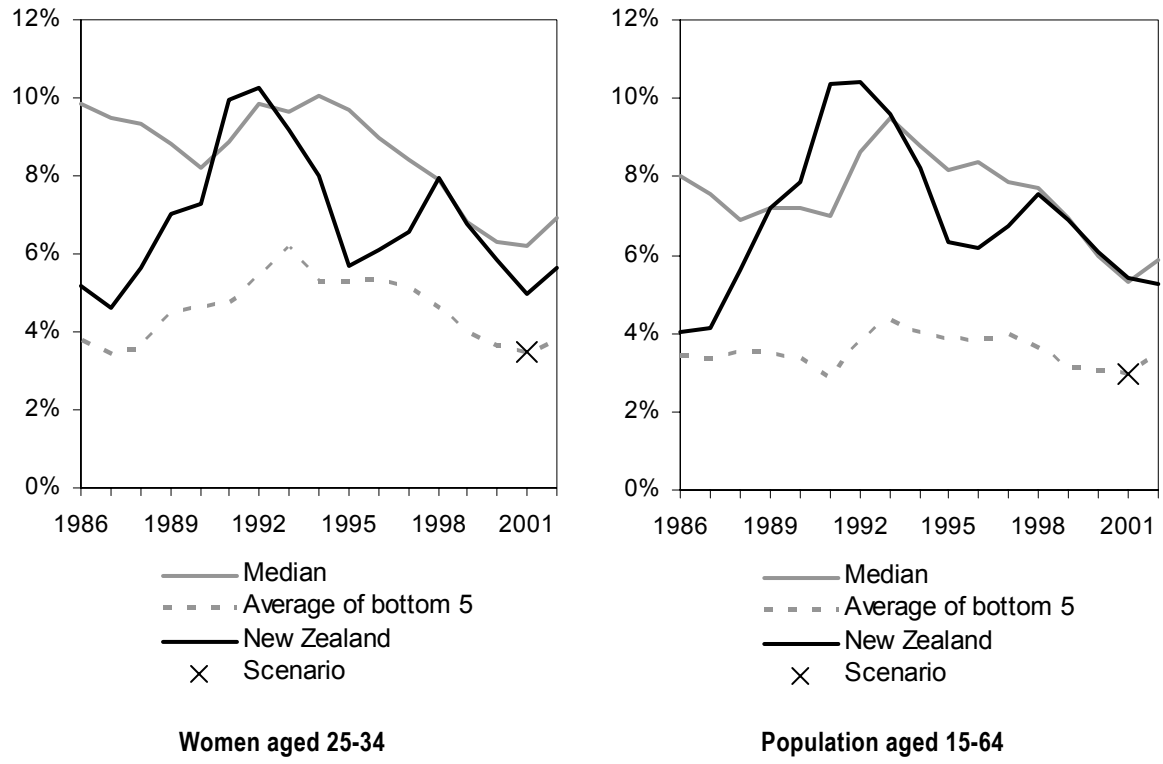
4 Alternative specifications

In this section we experiment with a number of alternative specifications, formed by systematically varying the underlying assumptions. Table 8 summarises the specifications and results.

In the benchmark specification, the increase in employees comes from labour force participation rates rising while unemployment rates remain constant. It represents a situation where more people join the labour market, and the employment prospects of those in the labour market remain constant. In Alternative 1, the increase in employees comes from unemployment rates falling while labour force participation rates remain constant. This specification represents a situation where the labour force stays the same size, but the employment prospects of those already in the labour market improve.

Figure 3 shows unemployment rates in New Zealand and summary measures for the sample of OECD countries. To generate Alternative 1, we set the unemployment rate, both for women aged 25-34 and for the population aged 15 and over, equal to the average of the 5 countries with the lowest unemployment rates.

Figure 3 – Unemployment rates, females aged 25-34, and population aged 15-64



Notes – The sample of OECD countries excludes the following: Hungary, Korea, Luxembourg, Mexico, the Slovak Republic, and Turkey. Employment rates are defined as the percent of people in a given age group who work at least one hour a week.
Source – Calculated from data in the OECD *Labour Market Data* online databases.

As is apparent in Table 8, the associated increase in GDP is much smaller than in the benchmark specification. The main reason is that unemployment is already low, so reducing it further generates only a small number of extra employees (2,800 in the "young women" scenario, and 46,400 in the "overall" scenario.)

Alternative 2 shows the effect of following the conventional practice of assuming that the average new employee is identical to the average existing employee, or, equivalently, that

GDP increases one-for-one with employment. The rise in GDP under this assumption is considerably higher than in the benchmark specification. This suggests, as expected, that the characteristics of new workers drawn into employment matters a great deal for economic growth. It also suggests that our benchmark result can be expressed as follows: GDP does not increase one-for-one with employment.

Alternatives 3 and 4 investigate why Alternative 2 gives higher results than the benchmark scenario. Alternative 3 retains the benchmark assumption that extra employees have the same productivity as people of the same age and sex who are not in employment, but follows Alternative 2 in assuming that the extra employees work the same number of hours as the average existing employee. This choice of assumptions gives a slightly higher GDP increase than in the benchmark specification. Differences between the hours worked by new employees and existing employees is evidently one reason why GDP does not increase one-for-one with employment, but is not the main reason.

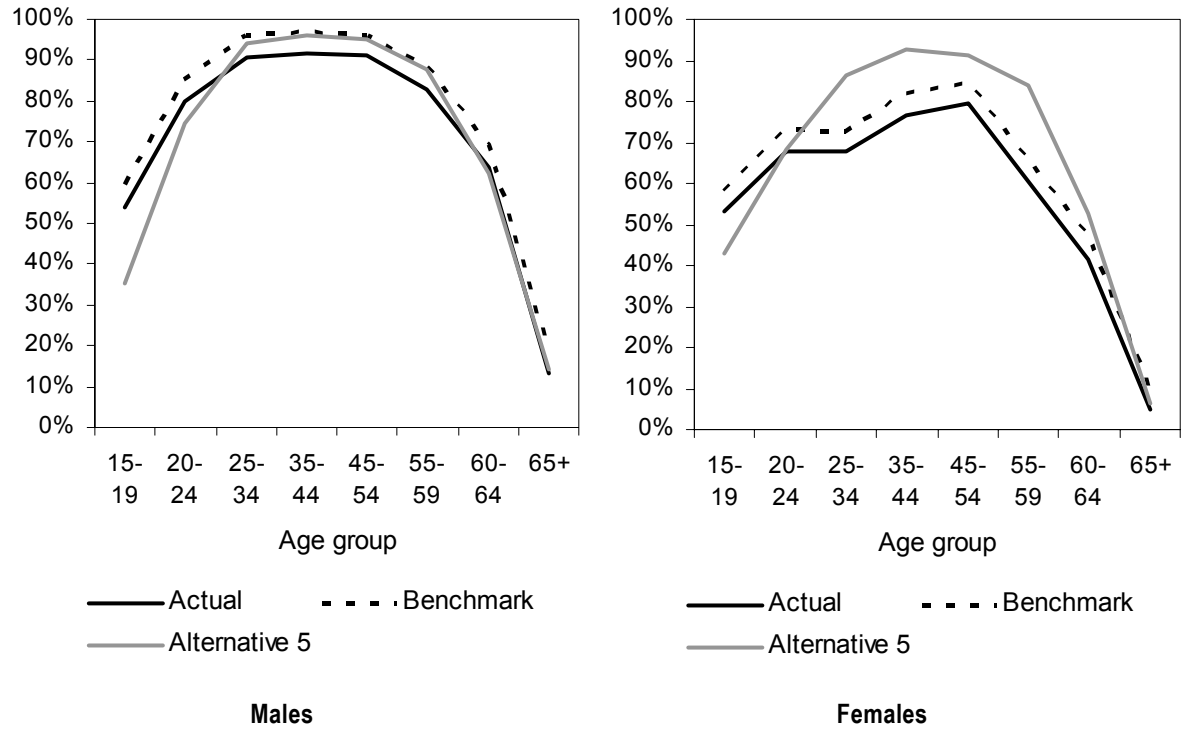
Table 8 – Benchmark and alternative specifications

Specification	Assumptions used in specification				Increase in GDP (as % of benchmark)	
	Participation rates	Unemployment rates	Hours worked by new employees	Productivity of new employees	"Young women" scenario	"Overall" scenario
Benchmark	In "young women" scenario, rate for women aged 25-34 rises by 11.0 points to adjusted average of OECD top 5. In "overall scenario", combined rate, and all age-specific rates, rise by 5.1points to average of OECD top 5.	Equal to actual rates	Equal to existing workers of same age and sex	Proportional to imputed wages of people not in employment of same age and sex	1.01% (100%)	5.06% (100%)
Alternative 1	Equal to actual rates	In "young women" scenario, rate for women aged 25-34 falls by 1.5 points. In "overall scenario", combined rate, and all age-specific rates, fall by 2.5 points	As for benchmark	As for benchmark	0.10% (10%)	1.79% (35%)
Alternative 2	As for benchmark	As for benchmark	Equal to average existing employee	Equal to average existing employee	1.58% (157%)	7.82% (155%)
Alternative 3	As for benchmark	As for benchmark	Equal to average existing employee	As for benchmark	1.12% (111%)	5.34% (105%)
Alternative 4	As for benchmark	As for benchmark	As for benchmark	Equal to average existing employee	1.39% (138%)	7.11% (140%)
Alternative 5 ("overall" scenario only)	Overall rate equal to benchmark. Age-specific rates equal Swedish rates multiplied by 1.05.	As for benchmark	As for benchmark	As for benchmark	-	6.01% (119%)

If the main reason is not hours, it must be productivity. Alternative 4 bears this out. It assumes that the extra employees have the same productivity as the average existing employees, while working different hours. It yields almost as high an increase in GDP as Alternative 2. It is clear that the relative productivity of extra and existing workers matters—there is a 40% difference in the increase GDP between the benchmark and Alternative 4 for the overall scenario, accounted for by the lower productivity of the extra workers. The difference for the "young women" scenario is 38%.

Alternative 5 applies only to the "overall" scenario. The increase in the participation rate for the population aged 15 and over is identical to the benchmark scenario. However, the breakdown of participation by age and sex is different. Whereas the age-specific rates in the benchmark scenario were obtained by adding 5.1 points to the actual New Zealand rates, the age-specific rates in Alternative 5 were obtained by making an adjustment to Swedish rates (Appendix 3 describes the calculations in detail). Sweden was chosen for two reasons. First, its overall rate was very close to the target participation rate of 71.1%. Second, and more important, the age and gender profile for labour force participation in 2001 was markedly different from New Zealand, with much lower rates for men and women at younger ages, and much higher rates for women aged 25 and over (see Figure 4). Sweden also has early retirement from the labour market and low youth employment.

Figure 4 – Age-specific labour force participation rates, New Zealand 2001



Source – Calculated from data in the OECD *Labour Market Data* online database.

Alternative 5 therefore tests whether the results on GDP increases are sensitive to assumptions about the age and gender of the new employees. As Table 8 shows, the GDP increase is larger under Alternative 5 than it is in the benchmark case. These results evidently are sensitive to assumptions about the age and gender of new employees. The reason why GDP is higher under Alternative 5 is that it implies a decrease in proportional share of low-productivity younger employees.

5 Conclusion

New Zealand's labour force participation rates are lower than the median of comparable countries in the OECD. The gap is particularly wide for women aged 25-34, suggesting that there is some scope to increase their participation in the work force. The OECD has suggested that increases in labour force participation could make a substantial contribution towards reducing the gap in per capita incomes between New Zealand and the rest of the OECD.

We have used scenarios that increase the labour force participation of young women and increase participation overall. These scenarios do not represent aspirational targets, and although a multitude of other scenarios are possible, they indicate the magnitude of the effect of increased participation. We have also examined a number of other alternatives, using different assumptions about productivity, employment and hours worked.

The results suggest that increasing the labour force participation of women aged 25-34 to the average, adjusted for paid maternity leave, of the top 5 OECD nations increases employment by 28,800 and generates an additional $1,215million of GDP, making GDP 1.0% higher than it actually was in the baseline year 2001.

Raising participation overall to the average of the top 5 OECD countries increases employment by 142,600 and generates additional $6,101 million of GDP, an increase of 5.1% more than it would otherwise have been.

The results suggest that increases in participation do increase GDP. However, they also show that differences in productivity between new and existing workers matter—increases in participation lead to a less than proportional increase in GDP. Yet the scenarios considered are static, and it is likely that new workers would enhance their productivity over time, so the sustained impact is likely to be higher. At the same time, however, the extra workers require considerable capital investment just to achieve the assumed productivity levels.

It is evident that a key target group for increasing participation is young women. However, it is not clear to what extent increased participation by young women would lead to real increases in output. For example, if the effect is simply to substitute paid for unpaid work such as childcare, there might be an effect on measured GDP, but the real impact on the economy might be overestimated. On the other hand, the real impact of increased participation may be underestimated since effects such as increased social inclusion, higher incomes and outcomes for children are not captured in measured GDP (Blank 2000).

GDP has well-known limitations as a measure of well-being. However, some of the factors that drive GDP also have important implications for well-being. In particular, employment has important effects on both income and well-being as it provides social inclusion and protects against poverty. It also has intergenerational effects, and entering employment from welfare can break the cycle of disadvantage and poverty for the worker and his or her children.

The fiscal implications of increased participation are not considered in the paper. Low participation can be fiscally costly to the extent that non-participants receive welfare benefits, so that increased participation can reduce the fiscal burden and increase tax revenues. However, government policies to increase participation can be fiscally costly. In addition, they have opportunity costs.

This paper is an initial step in a wider research programme on labour force participation. It has simply addressed a simple question: "What would be the output effects of increasing labour force participation?" The results suggest that increased participation would increase economic activity by $6,101million. These estimates also provide an indication of how much it would be worthwhile spending in order to lift participation rates.

An important issue is the extent to which government policy is in fact able to assist in raising participation. The behavioural responses of marginal workers to changes in government policies that directly or indirectly affect them are important in determining the effects on the labour supply. In addition, government policies designed to increase labour force participation are costly, and their efficacy is variable (Blundell 2001). Evaluations of policies typically focus on the private, equity effects benefits of getting people into work rather than on the effects on economic growth (see for example, Blank 2002). Evidence from welfare-to-work policies in the US suggest a combination of pre-and post-employment strategies are successful in getting people into jobs (Gueron and Hamilton 2002).

Furthermore, the estimates of the effects of participation on GDP are premised on the existence of sufficient demand to absorb the extra workers. Clearly, the impact of increased participation in an economic downturn might simply to add to unemployment rather than to employment.

Increasing participation in the workforce that increases output per worker contributes to the output of the economy as a whole. This paper shows that increasing labour force participation could therefore help to close the gap between New Zealand and the rest of the OECD. Future work will focus on examining how labour force participation can be increased.

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Appendix 1 – Supplementary data

Appendix Table 1 – Employment, unemployment, and participation rates in 2001, women aged 25-34

	Employment		Unemployment		Labour force participation	
	Rate	Rank	Rate	Rank	Rate	Rank
Australia	66.6%	16	6.1%	11	70.8%	18
Austria	76.2%	7	3.6%	3	79.0%	9
Belgium	73.2%	10	8.0%	15	79.6%	8
Canada	74.8%	8	6.4%	12	79.9%	6
Czech Republic	60.4%	19	12.6%	17	69.1%	20
Denmark	78.5%	3	4.5%	6	82.2%	3
Finland	70.1%	14	10.8%	16	78.6%	10
France	68.6%	15	12.7%	18	78.5%	11
Germany	70.7%	13	6.8%	13	75.8%	14
Greece	57.3%	22	18.7%	21	70.5%	19
Iceland	82.6%	1	-	-	84.6%	1
Ireland	73.5%	9	3.3%	2	76.0%	13
Italy	53.7%	23	16.2%	20	64.1%	23
Japan	60.7%	18	6.9%	14	65.2%	22
Netherlands	77.7%	6	2.5%	1	79.7%	7
New Zealand	**64.4%**	**17**	**5.0%**	**8**	**67.8%**	**21**
Norway	78.7%	2	3.7%	4	81.7%	5
Poland	60.0%	20	21.9%	22	76.9%	12
Portugal	78.4%	4	5.3%	10	82.8%	2
Spain	59.5%	21	16.1%	19	70.9%	17
Sweden	78.1%	5	4.9%	7	82.1%	4
Switzerland	-	-	-	-	-	-
United Kingdom	71.8%	11	4.4%	5	75.1%	16
United States	71.7%	12	5.1%	9	75.5%	15
Sample median	71.7%		6.2%		76.9%	
Average of 5 best	79.3%		3.5%		82.7%	

Source – Calculated from data in the *Labour Market Data* online database.

Appendix Table 2 – Employment, unemployment, and participation rates in 2001, population aged 15 and over

	Employment		Unemployment (population aged 15-64)		Labour force participation	
	Rate	Rank	Rate	Rank	Rate	Rank
Australia	59.1%	12	6.7%	15	63.3%	11
Austria	56.0%	16	3.7%	5	58.1%	17
Belgium	47.7%	20	6.2%	14	50.9%	22
Canada	61.2%	9	7.3%	16	66.0%	7
Czech Republic	55.1%	17	8.2%	18	60.0%	15
Denmark	62.4%	7	4.2%	7	65.2%	9
Finland	60.3%	10	9.2%	20	66.6%	6
France	49.9%	19	8.8%	19	54.7%	20
Germany	53.0%	18	7.9%	17	57.5%	18
Greece	43.8%	24	10.4%	22	48.7%	23
Iceland	74.6%	1	2.3%	1	76.3%	1
Ireland	56.9%	15	3.7%	6	59.1%	16
Italy	44.1%	23	9.6%	21	48.7%	24
Japan	58.9%	13	5.2%	12	62.0%	13
Netherlands	61.7%	8	2.7%	3	63.4%	10
New Zealand	**62.5%**	**6**	**5.4%**	**13**	**66.0%**	**8**
Norway	70.9%	2	3.5%	4	73.5%	2
Poland	46.1%	22	18.6%	24	56.3%	19
Portugal	58.9%	14	4.3%	8	61.4%	14
Spain	47.4%	21	10.5%	23	53.0%	21
Sweden	67.6%	3	5.1%	11	71.2%	3
Switzerland	66.1%	4	2.5%	2	67.8%	4
United Kingdom	60.0%	11	4.8%	10	63.0%	12
United States	63.7%	5	4.8%	9	66.8%	5
Sample median	59.0%		5.3%		62.5%	
Average of 5 best	68.6%		2.9%		71.1%	

Note – Employment rates are defined as the percent of people in a given age group who work at least one hour a week.

Source – Calculated from data in the *Labour Market Data* online database.

Appendix 2 – Calculation of GDP per hour

Let h_i be hours worked per week, and w_i the hourly wage of employed people in age-sex group i, as shown in Table 3. Let y_i be GDP per hour of employed people in age-sex group i, the first quantity we are trying to find. We assume that

$$y_i = \alpha w_i , \tag{1}$$

where α is an unknown constant. Let E_i be the number of employed people in age-sex group i in 2001, as shown in the first two columns of Table 2. Let Y be GDP in 2001, which was $120,509 million, according to the Statistics New Zealand (series SNCQ.S1NB15). By definition,

$$Y = \sum_i E_i \left(52 h_i\right) y_i \tag{2}$$

(where the 52 appears because there are 52 weeks in the year.)

Substituting in Equation 1 gives

$$Y = 52 \sum_i E_i h_i \alpha w_i , \tag{3}$$

which can be solved to give an equation for α,

$$\alpha = \frac{Y}{52 \sum_i E_i h_i w_i} , \tag{4}$$

and hence an equation for y_i,

$$y_i = \frac{Y}{52 \sum_i E_i h_i w_i} w_i . \tag{5}$$

Let y_i' be the imputed GDP per hour, and w_i' the imputed hourly wage, of people not currently in employment. We simply assume that

$$y_i' = \alpha w_i' . \tag{6}$$

Appendix 3 – Deriving age-specific employment rates for Alternative Specification 5

We set

$$e_i' = \alpha e_i \tag{7}$$

where e_i is the actual labour force participation rate for Swedes in age-sex group i in the year 2001, e_i' is the hypothetical rate for New Zealanders in age-sex group i, and α is an unknown constant. Let e' be the hypothetical rate for the whole New Zealand population aged 15 and over, which we set at 71.1%. Then

$$e' = \frac{\sum_i P_i e_i'}{\sum_i P_i} \tag{8}$$

where P_i is the number of New Zealanders in age-sex group i. Substituting Equation 7 into Equation 8 and rearranging yields an expression for α,

$$\alpha = \frac{e' \sum_i P_i}{\sum_i P_i e_i}, \tag{9}$$

which can be fed back into Equation 7 to give values for e_i'.

Appendix 4 – Adjusting women's labour force participation rates for paid maternity leave

Many OECD countries, including New Zealand, include women on paid maternity leave in their labour force statistics. While on maternity leave, these women are not contributing to the labour force productivity that drives GDP growth, as defined in this paper.[4] If the adjustment were the same for all countries, it could be ignored, as it would simply represent an equal level shift, between the NZ data and the OECD target used. However, three of the five countries in the "top five" target are Scandinavian, and paid maternity leave entitlements in these nations are substantially more generous than they are in NZ.

Data on paid maternity leave entitlements from various OECD countries (the numbers who take it up, the average length of leave, and so on) is not readily available, especially when decomposed into specific age groups. Hence we have borrowed from the approach taken by Gruen and Garbutt (2003). In Appendix 1 of their paper Gruen and Garbutt outline their approach to adjusting female participation rates for paid maternity leave

Gruen and Garbutt's adjustment is that the average paid maternity leave contribution, in percentage points, to a female age group labour force participation rate is:

> 100 X % of women in workforce before having children X Average number of children they have X Average number of weeks of paid maternity leave ÷ (Number of weeks in year X Number of years covered by age group)

They assume that, for the OECD countries with the highest female participation rates in the age groups 25-34 and 35-44:

1) 84% of women are in the workforce before having their child/children;

2) they receive an average of 22 weeks of paid maternity leave; and

3) the average number of children per woman, for females in the age group 25-34, is 1.1.

Applying these assumptions for the "25-34" young women age group, to the average labour force participation rate of the top five OECD nations, gives a correction of:

> 100x0.84x1.1x22/(52 x10) = 3.9%

For the NZ adjustment, we used data on the paid parental leave (PPL) entitlement, which suggests around 16,000 people take it up annually and 99.7% of these are female. We attribute all of these recipients to the 25-34 female age group. While there would be recipients in other age groups, there would also be women who receive other forms of maternity leave payments, rather than the PPL transfer. These two factors are likely to at least partially offset one another. Data on take-up of PPL also shows most recipients take it for the full 12 weeks of entitlement, so we assume an average of 11 weeks of paid maternity leave for NZ women.

[4] Many would argue that women on paid maternity leave are making the ultimate contribution to future GDP, by giving birth to the next generation of the country's workers, but this paper's emphasis is on the generation of present GDP.

We based the NZ adjustment on 2001 labour force figures, so that the NZ percentage point correction is:

> 100 X Number of women taking up PPL X Average number of weeks on PPL ÷ (Number of women in 24-35 age group in labour force X Number of weeks in year)
> = 100x16,000x11/(186,700x52)= 1.8%