

International Conference of the German Association of Political Economy  
(Arbeitskreis Politische Ökonomie)

**October 12 -14**

**Bundesagentur für Arbeit  
90478 Nürnberg  
Germany**

## **Economic Evaluation of Three New Zealand Active Labour Market Programmes**

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# Economic Evaluation of Three New Zealand Active Labour Market Programmes

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## *Abstract*

*This paper addresses two important aspects of active labour market policy evaluation with application to the New Zealand situation. The first aspect is evaluating the longer term impact on male participants of an active labour market policy intervention. Many studies have evaluated impacts up to only one year post intervention and this is particularly the case with evaluations in New Zealand. There is growing evidence that this time period is not sufficient as effects in the short term may prove to be transitory. Therefore, this study estimates the impact at time intervals up to three years post intervention. The second aspect addressed in this paper is a comparison of the impact of three specific labour market interventions representing three main types. These programmes are Jobs Plus, a subsidy programme, Community Task Force, a work experience programme, and Training Opportunities, a training programme. Difference-in-differences matching is applied to data drawn from a New Zealand panel dataset covering the years 1989 to 1997. The key findings are that Jobs Plus and Community Task Force have a greater impact than Training Opportunities. Further, there is no locking-in effect, there are beneficial effects in the short term for each programme, but there are no statistically significant long term effects for any of the programmes.*

## **1. Introduction**

Active labour market programmes are an important component of labour market policy in most developed economies. New Zealand is no exception, with 38.9% of labour market expenditure in 1995 on these programmes. The prominence of active labour market programmes in government social policy expenditure has been accompanied by increasing pressure from political, social and business groups to assess the effectiveness of this expenditure. The result has been an increase in studies evaluating active labour market programmes both internationally, and since the late 1980's, in New Zealand<sup>1</sup>. The major focus of this research has been on the impact of participation on participants, with short time periods of a year or less post-intervention being the usual time frame used by researchers. However, the results of this evaluation research remain inconclusive due in large part to the application of differing methodologies and differing samples. Further, these studies have often focused on one programme or one type of programme.

There is a growing consensus that evaluation of active labour market programmes needs to estimate the long term as well as short term impacts on participants. For example, Lechner, Miquel et al. (2004) find that the results for public training programmes in East Germany are sensitive to the time period used in the evaluation, and suggest that longer time-horizons should be employed. Recent evaluations have reflected this view, with Hotz and Imbens (2006) comparing short and long term outcomes in their re-

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<sup>1</sup> As noted by Mare, D. (2002) 36 evaluations were carried out between 1994 and 2000 using a wide range of techniques, assessed against the different objectives of the programmes but with a key question being the effect of participation in an active labour market programme upon participants. Many of these evaluations have been process evaluations or of a qualitative nature.

evaluation of the impact the California's Greater Avenues to Independence (GAIN) programme. Dyke et al. (2006) examine employment outcomes up to four years post intervention for welfare recipients in the Temporary Assistance for Needy Families (TANF) programmes in Missouri and North Carolina.

This study evaluates the impact upon male participants aged between 26 and 49 on 1 January 1989 and the fiscal cost effectiveness of three active labour market programmes used in New Zealand in the 1990s: Jobs Plus, a subsidy programme, Community Task Force, a work experience programme and Training Opportunities, a training programme. These were the major programmes in each of their categories in the 1990's. The parameter of interest when estimating the effect of participation on participants in this paper is the effect of 'participation on participants'. This is measured as the reduction in the time spent registered as unemployed among those participating in one of the three programmes.

The paper includes several features that are consistent with recent developments in economic evaluation methodology, as well as several extensions. The effect of participation upon participants is estimated using difference-in-differences (DID) matching, an approach that is appropriate in certain circumstances and has been used widely of late (Augurzky and Kluve 2004). While there is no "magic bullet" when it comes to evaluation, matching has the advantages that it resembles the estimator used in social experiments (Hujer and Caliendo 2000) and it does not impose functional form assumptions. DID matching also has the advantage of controlling for variables that may otherwise bias the estimation of the programme participation effects, since a DID matching estimator removes the impact of unobserved individual-specific, time-invariant factors. If these are the only unobserved variables of relevance, our resulting estimates are unbiased.

A further feature of the approach used here is that controls for local labour market conditions are included in our analysis, It has been shown that failure to control for these local labour market conditions can lead to biased estimates of programme effects (Dolton, Makepeace et al. (1994), Bryson, Lissenburgh et al. (1998), Heckman, Ichimura et al. (1998), Lechner (1999), Campbell (2000) Hoynes (2000) and Leahy (2001)). The study also analyses the effects of long term as well as short term impacts, with estimates for each year up to three years post intervention.

The paper is organised as follows. In Section 2 the institutional context and details of the programmes are provided. Section 3 outlines the key findings from the literature on the impact upon participants of participation in subsidy, work experience and training programmes. In section 4 the analytical framework is provided and details of the data are outlined in Section 5. The empirical approach for estimating the impact on participants is described in Section 6 and the results in Section 7. Concluding comments are provided in Section 8.

## 2. Institutional Features of the New Zealand Labour Market

In this section, the recent history of unemployment in New Zealand and the government response in the form of active labour market programmes is summarised. Details of each of the three specific programmes analysed in this paper are also presented.

Active labour market policy in New Zealand in the 1990's was a response to the increase in unemployment levels that accelerated from the early 1980's. In 1992 those registered as unemployed peaked at 215,562<sup>2</sup> (see Table 1). In the mid 1980's, the government response to unemployment moved away from its earlier emphasis on subsidised job creation schemes, often by public organisations, to a greater emphasis on training and private sector involvement. In the late 1980's and into the 1990's, there was a further adjustment, with training becoming even relatively more important and targeted at those considered most in need.

**Table 1: New Zealand Unemployment Rate 1986 to 1997**

Year	Total	Males
1986	4	3.6
1987	4	3.9
1988	5.6	5.6
1989	7.1	7.3
1990	7.8	8.2
1991	10.3	10.9
1992	10.3	10.9
1993	9.5	10.0
1994	8.1	8.5
1995	6.3	6.2
1996	6.1	6.1
1997	6.6	6.6

Percentage of the Labour Force Unemployed

Source: Statistics NZ, HLFS

These changes in approach are reflected in the statistics on the composition of expenditure on active labour market policy in New Zealand (see Table 2). The decline in spending on subsidy programmes and the increase in spending on training programmes is marked. Within the broad categories of expenditure it is apparent that by the early 1990's Jobs Plus was the main subsidy programme, Community Task force the main work experience programme and Training Opportunities the major training programme.

### *Jobs Plus*

The Job Plus programme<sup>3</sup>, an outgrowth from an earlier wage subsidy programme Jobs

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<sup>2</sup> Apart from a period in the early 1990's, New Zealand's unemployment rate has been below the OECD average (OECD 1996).

<sup>3</sup> Information on Job Plus is from a product listing at the Work and Income New Zealand site [http://wiznet/map/work\\_products/](http://wiznet/map/work_products/) and from a 1994 evaluation of Job Plus (Operations and Policy, 1994)

**Table 2: Percentage of Active Labour Market Expenditure in New Zealand on Specific Interventions**

Category	Year								
	1989-90 %	1990-91 %	1991-92 %	1992-93 %	1993-94 %	1994-95 %	1995-96 %	1996-97 %	1997-98 %
<b>Subsidies</b>									
Job Plus	38.9	34.2	47.3	54.7	53.6	65.7	67.7	61.6	63.6
Enterprise Allowance (including Jobs Opportunity Scheme)	12.2	9.7	18.6	13.7	14.1	na	na	na	na
Task Force Green	0.0	3.3	4.3	20.0	27.0	24.3	21.5	26.4	26.1
Other Specific Subsidy Programmes <sup>1</sup>	48.9	52.8	29.8	11.6	5.3	na	na	na	na
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<b>Work Experience</b>									
Community Task Force	0.0	0.0	7.0	50.0	100.0	100.0	100.0	100.0	100.0
Other Specific Work Experience Programmes	100.0	100.0	93.0	50.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<b>Training</b>									
Training Opportunities Programme	0.0	0.0	1.3	44.3	58.9	63.7	63	62.3	58.7
Other Specific Training Programmes	100	100	98.7	55.7	41.1	36.3	37.0	37.7	41.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

na = not available

<sup>1</sup> The percentages on Other Specific Subsidy programmes for 1994-5, 1995-6, 1996-7 and 1997-8 are not calculated as the data for expenditure on Enterprise Allowance in those years is not available

Source: Department of Labour, NZ

Opportunity Scheme, was introduced in 1990 and remains in place today. The aim of Job Plus is to assist disadvantaged job seekers gain permanent employment by providing a wage subsidy to employers for the early part of their employment.

The operation of this programme involves the matching of participants with the particular employment employers. Eligibility depends on the potential participant being registered as unemployed for at least 26 weeks, being dependent or partly dependent on government financial assistance and being disadvantaged in their local labour market. There were some explicit exclusions from participation in this programme, including the situation where a person had been a previous employee of the business.

In order to attract a Job Plus wage subsidy, the proposed position has to be permanent, that is it has to last longer than the subsidy period, and it has to involve thirty hours or more work per week; that is it needs to be a full-time position. Further, the employer needs to identify how he/she would support and train the participant. The level of the subsidy and the duration of the subsidy are negotiated between the New Zealand Employment Service and the employer. From the New Zealand Employment Services viewpoint, the subsidy reflects the participant's disadvantage in the local labour market, rather than being designed to support the employer's business. There was a maximum subsidy level, it varied but was around \$200 per week or \$11,000 per year, and these were paid to the employer every four weeks in arrears. The average duration of the subsidy was for six months although it could be shorter and it could be extended up to one year in total.

The expected outcome from the programme was that the participant would either retain the position when the subsidy ended or moved into unsubsidised work within eight weeks of completing the spell of subsidised employment. However, there has been some questioning as to whether or not the Job Plus positions are permanent, as intended by the programme criteria. A survey of participants in 1992 found that 40% had left their Job Plus employer within one month of the end of the subsidy, and of this group 25% gave redundancy as their reason for leaving (Operations and Policy 1994)

Job Plus has now been operating for thirteen years, a clear indication of government support for this programme. It remains a key part of the current government's active labour market strategy and, further, since 1998 two other programmes have been developed out of Job Plus. These programmes are Job Plus Maori Assets, focusing on providing a similar intervention for Maori, and Job Plus Training, under which employers receive subsidies to help pay for special skills that their workers may need, including pre-employment training.

#### *Community Task Force*

The major work experience programme in place from June 1991 until September 1998 was Community Task Force, when it was renamed Community Work. The scale of Community Task Force was limited to 2,500 job seekers at any time until mid 1997 at which point it was expanded to an annual target of between 7,000 and 10,000<sup>4</sup>.

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<sup>4</sup> The information on Community Task Force is mostly from Centre for Evaluation. (1999) and de Boer, M. (2000).

There were three main objectives for Community Task Force: firstly, to provide eligible job seekers with the opportunity to gain part-time work experience in a supportive environment in order to move them closer to employment; secondly, to enable sponsors to complete projects of benefit to the community or environment that could not otherwise be undertaken; and thirdly, to provide an opportunity to assess a job seeker's commitment to job search, as a work test measure. This third objective meant that compulsory referrals were possible. However, 90% of participants in the programme were actually volunteers (Evaluation 1999).

The operation of this programme involved the matching by an employment advisor of a potential participant with an appropriate project, sponsored mainly by voluntary or government organisations, with only 6% being from the private sector. Duration of projects ranged from a minimum of eight weeks to a maximum of twenty six weeks, although they could be renewed. The largest group of sponsors was educational institutions and projects were mainly focused on education and the natural environment. However, an evaluation of Community Task Force in 1999 (Evaluation 1999) finds that many of the projects represented ongoing maintenance work that was part of the normal work of organisations and not necessarily activities that would not have been undertaken otherwise. The sponsors were responsible for covering the costs of the project, apart from the participants' labour input, while the New Zealand Employment Service continued to pay normal benefits as well as a \$20 per week allowance to participants. An assessment of Community Task Force found that it was cheaper to operate than both Taskforce Green and Job Plus (Centre for Evaluation 1999:24)

To be eligible for the programme a potential participant had to have been registered as unemployed with the New Zealand Employment Service for at least thirteen weeks, with a particular focus on those who had been unemployed for 52 weeks or more. However, some job seekers with less than thirteen weeks on the register could participate under special circumstances, for example for people just released from prison. Participation rates in Community Task Force were highest for Maori, older job seekers, women and those in rural areas. Once a participant had been matched with a project the participant provided their work in an unpaid capacity, although they continued to receive income support. Participants worked three days, with full time work-tested beneficiaries working six to eight hours per day and part time work-tested beneficiaries working between three and four hours per day. The participants were monitored by their employment advisor during the project, and also within two weeks of finishing the project, when an in-depth interview concerning future options was completed.

Although there are some strong similarities between Task Force Green and Community Task Force they are placed in different categories with the former being a subsidy programme and the latter a work experience/job creation programme. Given the similarities this difference in classification is not clear cut. However, there are several reasons why this categorisation is appropriate. Firstly, under the Task Force Green programme the organisation that employed the participants were required to pay a minimum wage, with the aid of a subsidy from the government. With Community Task Force the New Zealand Employment Service paid the participants their normal benefit income with a top up. A further difference is that on Task Force Green the participants worked a full week while on Community Task Force it was for

only three days a week. These characteristics of the programmes indicate that Task Force Green had the features of a subsidised job, while Community Task Force did not. A further factor suggesting the classification used in this study is that (Mare 2002) in his study of active labour market programmes in New Zealand also classifies Task Force Green as a subsidy programme and Community Task Force as a work experience programme.

The importance that government placed both on work experience as an active labour market intervention and on Community Task Force as a specific intervention of this type is demonstrated by the expansion of the programme in 1997 and in 1998 by the introduction a new programme, Community Work, that copied, extended and enhanced the characteristics of Community Task Force. Throughout the 1990's, the number of people involved in this programme continued to grow.

### *Training Opportunities*

In 1993, the New Zealand Government introduced the Training Opportunities Programme with the key objective of enabling the disadvantaged in the labour market to develop skills and capabilities that would assist them into further education and employment. The predecessor of the Training Opportunities Programme was the Access Programme, in place from 1987 to 1992 which, while it was deemed to have been reasonably successful, was considered not to have been cost effective for people with higher levels of education, to have a complex administrative structure and to lack consistency in the standard of qualifications across regions and providers (Ministry of Education 2001). In early 1993, Training Opportunities replaced ACCESS and later in that year Maori ACCESS, which had run alongside ACCESS, was also subsumed. This situation continued until 1998 when a number of changes were made. Firstly, the programme was split into two; Training Opportunities for those eighteen years of age and over and Youth Training for those who were sixteen or seventeen years of age. Secondly, the funding that had been provided through Vote Education and administered by Skill New Zealand, formerly the Education and Training Support Agency, was split into two with a percentage subsequently being funded through Vote Work and Income, with the intention of providing Work and Income New Zealand with more flexibility in accessing the programme. Training Opportunities is still the major active labour market training programme in 2007.

The original aim of Training Opportunities included targeting school leavers and long-term job seekers with no or low qualifications<sup>5</sup> and assisting them in gaining a recognised qualification that would help in moving them on to further education and eventually employment. The rationale for the programme was that “participation in second chance education provides the opportunity to break the pattern of disadvantage” (Te Puni Kokiri 2001:5). Therefore, the programme was integrated into the National Qualifications Framework, introduced in New Zealand in the early 1990's, with participants in the programme gaining unit standards from the Framework that could be built on to attain a recognised qualification, such as a National Certificate.

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<sup>5</sup> No qualification was defined as having fewer than three School Certificate subjects and low qualification having no qualification higher than sixth form certificate. School Certificate is a national examination for year 11 students and sixth form certificate for year 12 students.



The eligibility criteria for the programme from 1993 to 1998 were slightly different for school leavers compared with all other potential participants. As far as school leavers were concerned, they needed to be eighteen or nineteen year olds with low qualifications who had left school in the last six months and were registered as unemployed. Those who were not school leavers needed to have low qualifications, to have been registered as unemployed for at least twenty six weeks and be available to work at least twenty hours per week, although there was an exception for youth who needed to have been registered as unemployed for only thirteen weeks. Common to all potential participants was that they remained eligible to participate in the programme until they had earned 240 credits on the register of National Qualifications, whether inside or outside of the programme.

The programme was administered by Skill New Zealand with clients referred by the New Zealand Employment Service and the average length of Training Opportunities courses was twenty one weeks. The training varied from foundation or generic courses that focused on developing employability skills including literacy, numeracy, English, communication, use of technology, decision making, information gathering and analysing, planning, organisation and problem solving, to vocational and industrial skill based courses and also work based options for learners who were close to being work-ready in the view of the employment administrator. The approach for some was progressive, with those participants moving from foundation to vocational training. The training was mainly provided by New Zealand Qualification Authority registered and accredited Private Providers who were contracted by Skill New Zealand and who had to meet performance targets as agreed in their contracts. These were derived from the targets that the New Zealand government set for Skill New Zealand and included for participants both destination outcomes, often the requirement for a participant to be in employment or further training outside of the programme two months after completing Training Opportunities, and educational outcomes involving the achievement of credits from the Register of National Qualifications.

There have been several reviews and evaluations, both qualitative and quantitative, which have been used to judge the effectiveness of the programme and to refine its operation<sup>6</sup>. The outcome has been that the Training Opportunities Programme remains an important component of the current government's active labour market policy portfolio. (The key features of the three programmes are outlined in Table 3 below).

### **3. Findings from the Literature**

Over the last few decades, there has been a large growth in the number of evaluations of the effectiveness of subsidy, work experience and training programmes. Initially, most of these evaluations were undertaken in the United States, where mandatory evaluation is often a feature of federally sponsored programmes, but there has also been an increasing incidence of evaluations undertaken in Europe since the 1980's.

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<sup>6</sup> These include Education Training and Support Agency, N. Z. (1993), Nielsen, A. (1999), Ministry of Education, N. Z. (2001), Te Puni Kokiri, N. Z. (2001) and de Boer, M. (2003).

**Table 3: Summary of Features of Jobs Plus, Community Task Force and Training Opportunities**

<b>Programme</b>	<b>Type</b>	<b>Participant Eligibility Criteria</b>	<b>Length of Intervention</b>	<b>Time Frame</b>
<b>Job Plus</b>	Subsidy to the employer	<ul style="list-style-type: none"> <li>disadvantaged in the local labour market</li> </ul>	Average: 40.6% of a year (maximum is one year)	1990-current
<b>Community Task Force</b>	Work experience	<ul style="list-style-type: none"> <li>disadvantaged in the local labour market</li> </ul>	Average: 32.3% of a year (range from 8 weeks to 26 weeks)	1991-1998
<b>Training Opportunities</b>	Training <ul style="list-style-type: none"> <li>generic and specific</li> <li>classroom and workplace</li> </ul>	<ul style="list-style-type: none"> <li>school leavers: left school in last 26 weeks and registered</li> <li>low qualifications</li> <li>less than 240 credits on Register of National Qualifications</li> </ul>	Average: 24.4% of a year (maximum is 240 credits on Register of National Qualifications)	1993-current

Much of the empirical research on the effects of active labour market policies on rates and duration of unemployment is European-based, as the major labour market issue facing countries in Europe has been unemployment. Studies undertaken in the United States have concentrated on the effects of active labour market policies on earnings, as the distribution of earnings has been a major societal concern and research issue. In this section the key findings on the effect of participation upon participants from this literature are reviewed.

### **3.1 The Impact of Subsidy Programmes**

Subsidies remain an important component of active labour market policies in several countries, particularly in continental Europe, based on their perceived benefits. While a range of subsidy programme have been used, including subsidies to employers, subsidies to employees and start-up subsidies, Jobs Plus is a subsidy paid to employers. The findings below, therefore, concentrate on those studies. Overall, the results of these studies are inconclusive with some finding positive effects, others negative and yet others insignificant effects upon participants.

There are a number of studies that suggest that subsidy programmes provided through employers have a negative or insignificant impact on participants, compared with the counterfactual of not participating in these programmes. (Erhel, Gautie et al. 1997: 294), reviewing a number of United States' studies, suggest that the findings are overall pessimistic. The reasons for this, they argue, are that the level of subsidy to employers is often insufficient to overcome their reluctance to employ the least employable and that wide targeting of the subsidy results in large deadweight losses.

Some of the research on European subsidy programmes has produced similar results. Using matching estimation (Kluve, Lehmann et al. 2005) find that wage subsidy schemes applied in Poland in the early 1990's have a strongly negative effect upon men and an insignificant effect upon women participants. They note that this is likely to be due to stigma effects and benefit churning, wherein individuals participate in the programme as it enables them to meet criteria to continue being eligible for the unemployment benefit. This negative effect of subsidies is also found for the Workstart Pilots in Hull and Medway/Maidstone, England (Bryson, Lissenburgh et al. 1998). In these pilots, people aged 18 to 50 who had been receiving the unemployment benefit for at least two years, had access to employment subsidies provided through employers and to job search assistance. There were benefit penalties if individuals who met the criteria chose not to participate. The results are that eight months after the start of the programme, while there is an increase in movement to jobs in Medway, these are to temporary or part-time positions. In Hull, there is no real effect. (van Ours 2004), using duration analysis to estimate the effect of subsidy programmes in Slovakia, finds that while subsidised jobs of a short duration are effective, long-term subsidised positions actually reduce the likelihood of the unemployed moving into work compared with those who do not participate due to locking-in effects. The locking-in effect is where attachment to welfare increases as a result of participants committing to an intervention and reducing their effort to move out of unemployment. In other words it is the effect on the probability of finding employment due to participation in an intervention programme (Sianesi 2003). A similar result is found for Germany where the effects of a twelve month subsidy scheme for men estimated over the 2000 to 2002 time period using matching techniques suggests that in the first twelve months there is a significant locking-in effect followed subsequently by an insignificant effect upon men (Caliendo, Hujer et al. 2005).

On the other hand, there are several studies that point to a positive impact of employer-based subsidy schemes. In a review of several United States studies, Blank and Card (2000) find that subsidies delivered through employers can increase the employment prospects of the disadvantaged. de Koning (1993) uses a quasi-flow macroeconomic framework to analyse the impact of two subsidy programmes in Holland. The two programmes offer employers who hire a person categorised as long-term unemployed compensation in the form of a wage subsidy. Taking into account deadweight and displacement effects, de Koning finds that both schemes add to the re-employment probability of the long-term unemployed. The microeconomic evaluations in Europe that find positive effects for subsidies allocated through employers are mainly for Swedish programmes. Carling and Richardson (2004), using hazard functions to estimate the impact, find that subsidised wage programmes in Sweden are more effective than classroom training. Fredriksson and Johansson (2004), also using hazard functions, find that while there are short-term locking-in effects, there are long run positive effects from participation in wage subsidy programmes in Sweden. Finally, Sianesi (2003), using matching estimation methods, finds that those who participate in subsidy programmes in Sweden have 20 to 25% higher employment rates five years after participation.

In summary, the research on the effects of subsidies on participants is inconclusive. It is apparent that while there may be benefits, they do not occur in all countries.

Further, these benefits vary over time and over the length of the subsidy. In the short run there is often a locking-in effect, as participants decrease their job search intensity. However, increasing the duration of a programme does not necessarily increase the positive effect of a programme. Evidence from Slovakia indicates that longer programmes may lead to a negative outcome due to stigma and longer locking-in effects (van Ours 2001).

### **3.2 The Impact of Work Experience Programmes**

Work experience programmes, of which Community Task Force is one, also known as job creation schemes and public service employment schemes, have been an important labour market tool in the OECD for many years. Examples of countries where these schemes are emphasised are Denmark, Finland, France, Germany, Ireland, the Netherlands and Sweden (Brodsky 2000: 32).

Most of these schemes involve the creation of positions for the unemployed under the auspices of the employment service. This may be centralised or devolved to local or regional administrators. Often there are criteria as to the activities that are appropriate to receive funding under the scheme and these tend to be those in the social, environmental or cultural spheres. While early programmes involved mainly work experience, later programmes have added on a combination of other inputs including job search, up-skilling and training. Participants receive remuneration and in some countries qualify for the non-wage benefits associated with working that are given to employees in general.

There are several reasons for the use of work experience schemes, some of which are related to the unemployed individuals and others that relate to broader society. As far as the unemployed are concerned, work experience schemes help them maintain attachment with the labour market and, through this, provide them with a number of benefits. The benefits include a material reward through the receipt of income from working, the retention and development of work habits, the prevention of the dissipation of human capital associated with being out of the labour market, not having to cope with the crisis of social exclusion that is associated with unemployment and an improvement in the prospects of gaining a job in the same or a similar sector (Vodopivec 1999). A broader reason for the provision of these schemes is that they may be used to provide for support for local and community organisations that provide useful public services (Muhlhausen 2005: 302), thus generating public good effects (Cockx 2000).

As with the research on subsidies, the evaluation studies on the effect of work experience schemes are inconclusive. While there are many studies that point to negative effects upon those who participate in these schemes, there are also some that point to positive outcomes. Muhlhausen (2005), in a review of major employment and training programmes in the United States<sup>7</sup>, notes that there is no consensus regarding the effects upon participants, with some finding positive effects and others negative. Like many of the United States evaluations, the studies reviewed concentrate mainly on the impact on wages and earnings. However, it is difficult in

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<sup>7</sup> The review covers the Manpower Development and Training Act (1962), Job Corps (1964), Comprehensive Employment and Training Act (1973), the Job Partnership Training Act (1982) and Workforce Investment Act (1998).

many of these United States studies to disentangle the effects of work experience from training and other effects (Cockx 2000). Brodsky (2000), in a review of work experience programmes across the OECD finds that although overall these programmes do not reduce the general level of unemployment, they do help the severely disadvantaged.

Negative impacts from participation in work experience programmes are prevalent in European studies. Kluve, Lehmann et al. (1999), Kluve, Lehmann et al. (2002), Kluve, Lehmann et al. (2005) and Kluve and Schmidt (2002) in several studies using matching estimators to evaluate the effects of active labour market policies in Poland in the 1990's find that participants actually spend more time unemployed subsequently than those who do not participate. This is supported by Puhani (1998), who also analyses the situation in Poland. Kraus, Puhani et al. (2000), using hazard rate models to assess the impact of work experience programmes in East Germany in the 1990's, and Hujer, Caliendo et al. (2003) for Germany in 2000 and 2001 find a similar result. This is also the case for Sweden where Sianesi (2003) using matching estimators finds that participants have lower employment rates than those who continue to search for jobs while not participating in the programme.

Negative effects from work experience programmes may occur due to locking-in effects as participants reduce their search effort relative to non-participants (Hujer, Caliendo et al. 2003). Further, there is evidence that those jobs without associated training or job search help are not successful at improving prospects for the unemployed (Cockx 2000: 473). Another factor that can contribute to the negative effect of participation is stigmatisation of those who participate, therefore decreasing their chances of finding employment (Vodopivec 1999: 114). Depending on the eligibility criteria, participants may also be using the programme to re-qualify for the benefit rather than as a stepping stone for moving out of unemployment, known as benefit churning or the carousel effect (Brodsky 2000: 35).

As well as the studies in the United States that find a positive effect, covered in the survey by Muhlhausen (2005), there are some European studies that evaluate the effect of work experience programmes on unemployment and also find positive effects. Agell (1995) using duration analysis finds a positive effect of work experience programmes in the early 1990's in Sweden, a result that contradicts that of Sianesi (2003). In a study of public employment programmes in Sachsen-Anhalt, East Germany, Eichler and Lechner (2002) contrast their own findings with those of previous studies. Using data from 1992 to 1997, they evaluate the effect of these programmes on those aged 22 to 55 in 1993 and find that participation significantly and substantially reduces the probability of participants being unemployed. This evaluation uses a difference-in-difference matching technique that can control for time-invariant influences that were not controlled for in the earlier studies. This positive effect is supported by Boone and van Ours (2004) who, utilising a macroeconomic framework to analyse active labour market policies across 20 OECD countries, find that increases in expenditure on work experience programmes cause a fall in unemployment.

In summary, there is no consensus as to the effect of work experience programmes upon participants. However, some general results are found to exist. Firstly, work experience programmes that include elements of other active labour market

programmes seem to be more successful. An example of how this has worked successfully is the United States' National Supported Work Demonstration that offered highly structured, full time paid work experience for up to eighteen months with close supervision and peer support (Cockx 2000: 472). Secondly, there is evidence that the effects, if positive, tend to dissipate quite quickly over time (Stanley, Katz et al. 1998) and (Vodopivec 1999).

### **3.3 The Impact of Training Programmes**

As noted by (obinson (2000), one of the clearest findings of labour economics is that those who are more skilled and have higher qualifications generally have higher incomes and probabilities of employment. The potential positive effect of training on the human capital of an individual and on subsequent labour market prospects has influenced the role of training in active labour market policy. Training became a major component of active labour market programmes throughout the 1990's. The International Labour Organisation states that training was the most important and promising component of active labour market policies in Europe in the mid to late 1990's<sup>8</sup>. It is also central to the approach to active labour market policies recommended by the OECD following its Jobs Study of the mid 1990's (OECD 1994). In New Zealand, Training Opportunities is mainly delivered via the classroom. The review of the effects of training below, therefore, covers the effects of classroom training in the United States and the findings from European evaluations of classroom training.

Much of the United States' research has focused on the effects of training upon the earnings and wages of participants, whereas the studies in Europe have more often evaluated the effect on employment and unemployment outcomes. However, a survey of studies from the United States finds that there is a strong correspondence between earnings impacts and employment impacts for most programmes (Heckman, LaLonde et al. 1999). Usually, should large earnings-impacts from programmes exist; they are accompanied by significant impacts on employment rates. The data suggests that the increase in earnings may be significantly influenced by the impact of the extra hours employed. It is worthwhile, therefore, given the commitment that the United States has made to utilising and evaluating training programmes over the last four decades, to analyse the findings from United States studies on the effects of programmes on earnings and the employment of individuals.

Microeconomic evaluation of training has a long history in the United States linked to the development of voluntary and mandatory training programmes. Voluntary programmes are those that provide training for individuals who apply for them and meet certain criteria, such as income level or employment status. Training programmes in New Zealand are voluntary, so programmes of this type in the United States are of most relevance for this study. The first major voluntary programme was funded in 1962 under the Manpower Development and Training Act (MDTA). Although initially intended to retrain workers dislocated by technological advances, it was converted into a job-training programme for the disadvantaged (Muhlhausen 2005). In 1973, the Comprehensive Employment and Training Act (CETA) replaced MDTA giving states and local governments the right to use federal grants to run their

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<sup>8</sup> Mentioned in Lechner, M., R. Miquel, et al. (2004).

programmes. The delivery of programmes was by public and not-for-profit organisations. This programme also had a public employment component. Comprehensive Employment and Training Act, in turn, was replaced in 1982 by the Job Training Partnership Act (JTPA), which eliminated the public service employment component, emphasised training and increased further the decentralisation of administration.

There have been many evaluations of each of these programmes. These specific studies have been synthesised to some extent in several review articles (Barnow (1987), LaLonde (1995), Friedlander, Greenberg et al. (1997), Stanley, Katz et al. (1998), Heckman, LaLonde et al. (1999), Lafer (1999) and Lafer (2002)). A range of estimation techniques, datasets and measures has been incorporated in these studies. However, with the introduction of JTPA in the United States, there was a move to the use of experimental evaluation techniques as programme administrators utilised random assignment to treated and non-treated states for potential participants. The evidence as summarised in the review articles is not consistent. Overall, LaLonde (1995), Friedlander, Greenberg et al. (1997), and Stanley, Katz et al. (1998) find mixed results including positive but modest gains for some participants in training programmes in the United States. This is confirmed by the review of studies undertaken by Heckman, LaLonde et al. (1999). However, the effects have varied over time and across different groups of people.

Studies of pre-JTPA programmes find that while women gain, the effect on men is often negative, with their earnings and employment prospects declining following involvement in the programme. Major studies undertaken to evaluate the effect of JTPA programmes at 18 months and 30 months following participation in training confirm the findings for women in earlier studies: they received significant gains in earnings and their gains were greater than for other groups (Bloom, Orr et al. (1993) and Orr, Bloom et al. (1995)). However, the JTPA results contrast with the earlier CETA results in that the earnings of adult men also increased with classroom training. The evaluation studies of the JTPA training programmes show that the impacts vary over time with the earnings impact for men only significant in months 19 to 30 (OECD 1996). Further, the findings suggest that the impact of the programme is greatest for individuals whose labour market problems are limited. Evidence for this is that training raised the earnings of the upper quartiles of participants, but did not do so for the lower quartiles (Abadie, Angrist et al. 2002). The impact is not significant for persons combining a number of disadvantages, for example previous welfare dependence, no high school diploma and no recent work experience (OECD 1993). The effect on non-whites varied with it being negative for Hispanics, but positive for Blacks. However, in both cases the findings were insignificant.

The evidence from the United States suggests that the impact of training programmes has been, at best, modest. Lalonde suggests that with respect to training programmes in the United States the

...best summary of the evidence about the impact of past programmes is that we got what we paid for. Public sector investments in training are exceedingly modest compared to the magnitude of the skill deficiencies that policy makers are trying to address. Not surprisingly modest investments yield modest gains. (LaLonde 1995: 149)

When examined at a disaggregated level, it is apparent that the main beneficiaries from training programmes have been women, with men in general suffering negative or insignificant effects from some of the programmes. However, the impact on men appears to have improved with participation in JTPA programme. There are findings that the effects vary over time and have heterogeneous effects across different subgroups.

The results for European studies are also mixed, but there are several which find statistically significant impacts. Lubyova and van Ours (1999) and van Ours (2001) analyse the effect of training in Slovakia upon a selected sample of individuals who became unemployed in 1993 and for whom they have data until 1998. They find that there is a positive effect on the transition from unemployment to employment as a result of participation in training. Further, they point out that it is necessary to take into account sample selection in the estimation, as a failure to do so leads to negative results. Positive impacts are also found in Austria (Zweimuller and Winter-Ebmer 1996). In a review of 50 studies evaluating the impact of training in the Netherlands, de Koning (2002) reports results similar to the United States, with small positive impacts on average.

Negative effects have also been reported from studies of training impacts in European countries. Cockx and Bardoulat (1999) analyse the effect of classroom training in Wallonia, Belgium using data on all the registered unemployed from 1989 to 1993. They find that, on average, participation in training reduces the transition rate out of unemployment. However, this negative effect results from strong locking-in effects as there is evidence that the transition rate improves if individuals are still unemployed after the completion of training. There are several evaluations that find negative results for Sweden (Agell (1995), Richardson and van den Berg (2002) and Sianesi (2003). Across these studies, a range of estimation techniques are used, including Ordinary Least Squares regression, fixed effects regression, random effects regression, matching estimators and duration analysis. As well as this, there are different approaches in these studies to choosing the appropriate sample of participants and non-participants. The results, that participation in training programmes in Sweden has either a negative or an insignificant impact upon participants, and males in particular, is robust to these differences.

For some of the countries where evaluations have been carried out, there are both positive and negative findings about the impact of participation in training programmes on participants. For example, for Norway there are positive impacts (Torp, Raaum et al. (1993) and Torp (1994)) as well as negative (Aakvik, Heckman et al. 2000). In Denmark, there are also some negative findings for participation in training. Rosholm and Skipper (2003) evaluate classroom training using experimental approaches and find that training increases unemployment due to locking-in effects. On the other hand, Jensen (1993) finds that men who undertook training, experience a decrease in post-training unemployment. He reaches this result using fixed effects regression analysis to evaluate the effect of Danish programmes upon a sample of 38995 people drawn randomly from the Danish Longitudinal database covering the 1976 to 1986 time period.

(Wunsch 2005: 40-41) reviews many studies for Germany undertaken since unification and reports that although most studies of East Germany have found



negative or insignificant effects some of these studies are positive. As far as West Germany is concerned, Wunsch reports that early studies found positive short-term effects upon participants that disappear subsequently. The reason for this contrast in findings for evaluations of training programmes is addressed by Lechner, Miquel et al. (2004) in their study of West Germany public sponsored training programmes using a database with information on participants and non-participants from 1991 to 1997. They suggest that there are differences in findings depending on the length of the programme and the time period over which the evaluation occurs. In the short-term, they find that programmes have strong locking-in effects, but that these disappear over time to be replaced by positive effects. They find, therefore, that while short-term programmes may not have a major impact on the long-term employment prospects of participants, that long programmes are not necessarily the answer. In Germany, there are programmes of two year duration and with these the locking-in effect is so strong that even several years later the positive effects do not outweigh these earlier negative effects.

The importance of the time period over which the evaluation is conducted in order to explain different outcomes is also evident in the Polish research. There is a similar contrast for findings on the effects of participation in training programmes in Poland. Studies by Puhani (1998), Kluve, Lehmann et al. (1999) and Kluve and Schmidt (2002) find positive effects upon participants. Puhani uses matching and duration estimators while Kluve et al. and Kluve and Schmidt use matching estimators. They find that employment prospects are enhanced noticeably compared with non-participants. However, a recent study by Kluve, Lehmann et al. (2005) reverses this finding. They find, in fact, that it is necessary to consider time periods over which studies are taken, as there is a positive effect in Poland in the first year that becomes negative subsequently.

In summary, despite the emphasis placed on training, the results from evaluation studies are not conclusive as to the effects of this on participants. There are indications that the effects vary across groups and also over time. On average, women appear to have greater benefits from participation than men, and in fact the impacts on men may be negative or insignificant. The research also indicates that the least advantaged groups benefit less than those groups that are more advantaged. Stigma effects and locking-in effects can contribute to negative outcomes and this supports the finding that the time period over which a study is undertaken can influence the results.

## **4. Analytical Framework**

The discussion on analytical framework is outlined in two sections. The first presents the evaluation problem and the problem of selection bias. The second section outlines how DID can solve the evaluation problem and, in certain circumstances, the problem of selection bias.

### **4.1 The Evaluation problem**

Evaluation is concerned with how an individual's outcomes are altered or changed as a result of an intervention; that is, as a result of participation or treatment in a programme (Cobb-Clark and Crossley 2002). For example, there are two outcomes,

$Y_{0i}$  and  $Y_{1i}$ , associated with two treatment states,  $D_i$ . If the individual does not receive treatment  $D_i=0$  and if the individual receives treatment  $D_i=1$ . This treatment may consist, for example, of participation in a training programme and the outcome may be probability of employment. The aim of an evaluation is to identify the impact on an individual of the treatment, which is given by:

$$\Delta_i = Y_{1i} - Y_{0i} \quad (1)$$

with subscript  $i$  standing for individual  $i$ . The time subscript,  $t$ , has been omitted here for ease of presentation. It will be included later when the issue of longitudinal data is considered explicitly.

In this conceptualisation, the evaluation problem is essentially a missing data problem. Firstly, it is not possible to observe both outcomes  $Y_{0i}$  and  $Y_{1i}$  for an individual since, if an individual has received the treatment, then  $Y_{1i}$  is observed but not  $Y_{0i}$  and vice versa. In other words, for each individual the observed outcome is:

$$Y_i = D_i Y_{1i} + (1 - D_i) Y_{0i} \quad (2)$$

Secondly, evaluation is a missing data problem as the researcher does not have sufficient data to create the counterfactual; that is the unobserved outcome, for each individual. The evaluation problem is, therefore, to identify the counterfactual or missing outcome so as to assess the impact of the treatment. Since, as mentioned above, it is not possible to identify this counterfactual for an individual, it is obtained by treating  $D_i$ ,  $Y_{0i}$  and  $Y_{1i}$  as random variables conditional on the available information (Heckman and Smith 1996: 42) and to estimate these based on samples.

For this approach to the identification of counterfactuals and estimation of treatment effects to be applicable, it is necessary that the impact of treatment on one individual is independent of treatment of other individuals (Hujer and Caliendo 2000). This is known as the stable unit treatment value assumption (SUTVA) which ensures there are no general equilibrium effects as a result of treatment (Lechner (1999: 77) and Frolich (2002: 3).

The most common treatment effect in the evaluation literature, and the one adopted in this study, is the average effect of treatment on the treated (TT). This evaluation parameter asks the question: "What is the expected gain on average to individuals who receive treatment as compared with the counterfactual situation where they do not receive treatment?" Conditional on available explanatory variables,  $C_i$ , the effect of treatment on the treated is given as:

$$E(\Delta_i | D_i = 1, C_i) = E(Y_{1i} - Y_{0i} | D_i = 1, C_i) = E(Y_{1i} | D_i = 1, C_i) - E(Y_{0i} | D_i = 1, C_i) \quad (3)$$

Since it is not possible to observe  $Y_{0i}$  for those who receive treatment, this is obtained from those who do not receive treatment, a comparison group, by assuming that:

$$E(Y_{0i} | D_i = 1, c_{ai}) = E(Y_{0i} | D_i = 0, c_{ai}) \quad (4)$$

and estimating the impact of treatment on the treated (TT) as:

$$E(\Delta_i | D_i = 1, C_i) = E(Y_{1i} | D_i = 1, C_i) - E(Y_{0i} | D_i = 0, C_i) \quad (5)$$

The evaluation problem, therefore, is a missing data problem since  $E(Y_{0i} | D_i = 1, C_i)$  is unobserved and the researcher is required to identify the relevant counterfactual,  $E(Y_{0i} | D_i = 0, C_i)$  in Equation 5, so as to estimate the causal impact of treatment. This counterfactual is the potential outcome for an individual in the state in which s/he is not observed.

A particular issue that creates problems when solving the evaluation problem is selection bias. This is the situation where there are unobserved factors influencing the participation of individuals in an active labour market programme that lead to differences in the counterfactual outcomes for participants and non-participants once observables have been taken into account. Using the outcomes of the non-treated as a proxy for the outcomes of the treated in the non-treated state gives:

$$\begin{aligned} & E(Y_{1i} | D_i = 1, C_i) - E(Y_{0i} | D_i = 0, C_i) \\ &= E(Y_{1i} - Y_{0i} | D_i = 1, C_i) + [E(Y_{0i} | D_i = 1, C_i) - E(Y_{0i} | D_i = 0, C_i)] \\ &= E(\Delta_i | D_i = 1, C_i) + [E(Y_{0i} | D_i = 1, C_i) - E(Y_{0i} | D_i = 0, C_i)] \end{aligned} \quad (6)$$

The second part of Equation 6 identifies the importance of this assumption. Should the assumption reflect reality and, therefore, the only reason that a difference in outcomes between the treated and those who do not receive treatment arises is as a result of the treatment, then the final part of Equation 6,  $E(Y_{0i} | D_i = 1, C_i) - E(Y_{0i} | D_i = 0, C_i) = 0$ , equals zero and  $E(\Delta_i)$  will be an unbiased estimate. However, if the outcomes in the non-treated state differ between the treated and non-treated, then the right hand side in 6 is not equal to zero, selection bias exists and  $E(\Delta_i)$  is a biased estimate. Should selection bias be present, it is necessary that estimators are used that take this into account for consistent estimates of the treatment effect are to be obtained.

## 4.2 DID Matching

The matching estimator is able to provide unbiased estimates of TT given a number of important assumptions. Continuing with the notation used above,  $C_{it} = (X_{it}, Z_{it})^9$  and  $Y_{1it}$  and  $Y_{0it}$  are the outcomes for  $D_i=1$  and  $D_i=0$  respectively. Key assumptions include that there are no general equilibrium effects and the following, from Rubin (Rubin 1979):

$$Y_{1it}, Y_{0it} \perp D_i | C_{it} \quad (7)$$

This is the conditional independence assumption (CIA), also known as the ignorable treatment assumption or selection on observables (Sianesi 2001: 16), which assumes

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<sup>9</sup>  $X_i$  are the individual specific variables that influence outcomes and  $Z_i$  are the individual specific variables that influence participation in the programme.

that conditional on all covariates the outcomes are independent of assignment to treatment. In fact, since matching is carried out on pre-treatment characteristics of participants and non-participants, it is enough to assume that

$$Y_{0it} \perp D_i | C_{it} \quad (8)$$

Further it is assumed that in large data sets for every participant there is a potential non-participant (Heckman 2001: 43); that is

$$0 < \Pr(D_i = 1 | C_{it}) < 1 \quad (9)$$

Under these assumptions matching removes selection bias as all the dependence between the between the treatment status,  $D_i$ , and the unobservables influencing the outcome is eliminated by conditioning on  $C_{it}$ . As a result

$$E(Y_{0it} | D_i = 1, C_{it}) = E(Y_{0it} | D_i = 0, C_{it}) = E(Y_{0it} | C_{it}) \quad (10a)$$

$$E(Y_{1it} | D_i = 1, C_{it}) = E(Y_{1it} | D_i = 0, C_{it}) = E(Y_{1it} | C_{it}) \quad (10b)$$

ensuring that the mean treatment effect can be estimated without bias

A major problem that may arise with simple pair matching is dimensionality if the quantity of observable characteristics,  $C_{it}$ , is high (Dehejia and Wahba (1998:2), Puhani (1998:7), Lechner (1999:9) and Sianesi (2001:18). A solution to this issue is proposed by Rosenbaum and Rubin (1983), who suggest using the propensity score to reduce the dimensions of the matching problem and to make it possible to match on a large number of covariates. The usefulness of this approach to matching is emphasised by the number of recent studies that have utilised various versions of propensity score matching (Heckman, Ichimura et al. (1997), Dehejia and Wahba (1998), Puhani (1998), Lechner (1999) and (2000), Brodaty, Crepon et al. (2001), Dehejia and Wahba (2002) and Lechner (2002)).

The propensity score is the conditional probability of assignment to a particular treatment given a vector of observed covariates. Matching uses this propensity score to match participants and non-participants on their estimated probability of participation  $P(C_{it})$ , rather than on a vector of observed characteristics (Smith 2000:11). Rosenbaum and Rubin (1984) show that assuming the conditional independence assumption and that for each treated person there is at least one non-treated person,

$$Y_{1it}, Y_{0it} \perp D_i | P(C_{it}) \quad (11)$$

In other words the dimensionality problem is reduced as the outcomes are independent of treatment given a single number, the propensity score. As with pair-wise matching a weaker condition will suffice;

$$Y_{0it} \perp D_i | P(C_{it}) \quad (12)$$

Conditioning on  $P$  eliminates the selection bias since

$$E(Y_{0it} | D_i = 1, P(C_{it})) = E(Y_{0it} | D_i = 0, P(C_{it})) = E(Y_{0it} | P(C_{it})) \quad (13a)$$

$$E(Y_{1it} | D_i = 1, P(C_{it})) = E(Y_{1it} | D_i = 0, P(C_{it})) = E(Y_{1it} | P(C_{it})) \quad (13b)$$

and the mean treatment impacts can be estimated without bias as we can use  $Y_{0it}$  for the comparison group as the counterfactual for the treated group.

Bias may arise should there be unobservables that influence participation or the outcome. The DID estimator may overcome this issue by removing the effect of individual specific, time invariant unobservables. Should these be the only type of unobservables then selection bias is removed. The DID matching estimator using the propensity score requires that the difference between the outcome before ( $t$ ) and after ( $t'$ ) the intervention time period for not participating is the same for both those who participate as for those who do not participate; that is

$$E(Y_{0t} - Y_{0t'} | P, D = 1) = E(Y_{0t} - Y_{0t'} | P, D = 0) = B \quad (14)$$

This condition requires that any bias ( $B$ ) that exists in the time period before the intervention continues to exist in the time period after the intervention. These time specific intercepts, or fixed effects, may arise due to administrators consistently choosing participants over time based on unobserved characteristics.

Following Smith and Todd (2005: 318), the difference-in-differences matching estimator is given by

$$\hat{\alpha}_{DDM} = \frac{1}{n_1} \sum_{i \in I_1 \cap S_p} \left\{ (Y_{1ti} - Y_{0ti}) - \sum_{j \in I_0 \cap S_p} W(i, j) (Y_{0tj} - Y_{0t'j}) \right\} \quad (15)$$

The weights in the difference-in-differences matching estimator ( $W(i, j)$ ) depend on the matching estimator that is chosen. For example, the difference-in-differences estimator can be implemented using single nearest neighbour, multiple nearest neighbour, kernel or local linear regression, and the appropriate weighting formula would then be applied.

The use of DID estimators in matching began only in the late 1990's (Heckman, Ichimura et al. (1997), Heckman, Ichimura et al. (1998), Eichler and Lechner (2002) and Smith and Todd (2005)). Research by Heckman, Ichimura et al. (1998) finds that, when compared with experimental estimates, and in the presence of the influence of unobserved variables that influence participation, the DID estimator outperforms other matching estimators.

## 5. Data

The data for this research were primarily obtained from the Labour Market Policy Group, New Zealand Department of Labour<sup>10</sup>. They come from two administrative data sets, an enrolment dataset and an intervention dataset compiled from various New Zealand Employment Service (NZES) data sources, which had been collected by the NZES<sup>11</sup> between 1 October 1988 and 31 December 1997. The enrolment dataset contains demographic, economic and labour market information on clients who were registered with NZES as unemployed at any time between 1 October 1988 and 31 December 1997<sup>12</sup>. There are 2,476,898 spells of unemployment from 1,145,168 different clients. The intervention dataset contains details of all interventions for NZES clients between 1 October 1988 and 31 December 1997. Each time an intervention occurs, 3,652,222 interventions in all, there is an entry in the dataset<sup>13</sup>. The two datasets are connected by a unique identifier.

The datasets provide complete coverage of those who registered as unemployed at some point in time between 1 October 1988 and 31 December 1997. However, due to the omission of details on family status and the number of dependent children an individual has the evaluation focuses on the effect of active labour market programmes on males, not on females. Since there is limited information on participation in formal education and movement to retirement, the age range for the evaluation to avoid the potential influence of these two factors on labour market outcomes is between 26 and 49 years of age on 1 January 1989. Given these restrictions, the combined dataset contains 257,537 males.

Difference-in-differences matching requires pre-intervention and post-intervention data for both participants and non-participants. Pre-intervention data are required to generate the propensity score for this matching. Post-intervention data are required to estimate the effects of the active labour market programmes. In order to achieve this, a “cohort dataset” was created. This is in line with approaches adopted by some researchers since 2000 (Aakvik, Heckman et al. (2000), Conniffe, Gash et al. (2000), Magnac (2000), Angrist and Lavy (2001), van Ours (2001) Bolvig, Jensen et al. (2002), Bratberg, Grasdal et al. (2002), Gerfin, Lechner et al. (2002), Mare (2002), O’Connell and McGinnity (2002), Raaum and Torp (2002) and Regner (2002)).

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<sup>10</sup> In July 2004 the Labour Market Policy Group was disbanded as the Department of Labour changed its strategic direction and reorganised.

<sup>11</sup> The New Zealand Employment Service (NZES), part of the Department of Labour, maintained the register of all unemployed over the duration of the data set and was also responsible for administering many of the ALMPs. Unemployment benefits were administered by Income Support, part of the Department of Social Welfare. In 1998 NZES was integrated with Income Support to form Work and Income New Zealand (WINZ) and in 2001 WINZ became part of the Ministry of Social Development that had been established in 2000.

<sup>12</sup> The following variables are included in the dataset each time a client had an unemployment spell: start date of the spell, end date of the spell, a unique client number, date of birth, gender, ethnicity, highest educational qualification, reason for leaving the register, office at which the client is registered, preferred occupation, barriers to employment and hours available to work.

<sup>13</sup> The following variables are included in the dataset each time an intervention occurred: the office which manages the client, start date of the intervention, a unique client number which is the same as that in the enrolment dataset, end date of the intervention, the type of intervention and the immediate result of the intervention.

In this study, two intervention years (1993 and 1994) are selected for the cohort. For the 1993 group, the pre-intervention data cover the four-period 1989 to 1992, and the post-intervention data cover the three-year period 1994 to 1996. For the 1994 group, the pre-intervention data come from the years 1990 to 1993, and the post-intervention data come from the years 1995 to 1997. The creation of a single cohort from these two periods requires the creation of a concept of time based around the years of intervention, rather than on calendar years. This is achieved by identifying the year of intervention as time  $t$ , the pre-intervention years as  $t-4$ ,  $t-3$ ,  $t-2$ , and  $t-1$ , and the post-intervention years  $t+1$ ,  $t+2$  and  $t+3$ . In this way, the variables containing the data for the pre-intervention, intervention and post-intervention years are all aligned (see Table 4).

**Table 4: Establishing Time in the Cohort Dataset**

Group	Pre-Intervention				Intervention	Post-Intervention		
	$t-4$	$t-3$	$t-2$	$t-1$	$t$	$t+1$	$t+2$	$t+3$
1	1989	1990	1991	1992	1993	1994	1995	1996
2	1990	1991	1992	1993	1994	1995	1996	1997

To be included in this cohort dataset, a participant must have received an intervention in either 1993 or 1994 and must not have received another intervention during the other seven years. The comparison group in the cohort dataset consists of those who were unemployed in the period preceding the time of potential intervention, a key determinant of participation in active labour market programmes, but who never received an intervention at any time from 1989 to 1997.

The characteristics of individuals in the cohort are presented in Table 5. There are a total of 42,439 males of which 4,043 received one of the three programmes. When comparing those who received an intervention with those who did not, the former group has a greater percentage who have lower levels of education and whose ethnicity are Maori or Pasifika than the latter. Further, those who receive interventions have a higher unemployment propensity in both in the years before and after the intervention, with the propensity to be unemployed for both groups being lower post  $t$ . A key difference is that those who receive an intervention are predominantly long term unemployed whereas those who do not are mainly in the short term unemployed category as at time  $t$ .

There are some noticeable differences between the characteristics of males on each of the three programmes. Jobs Plus and Community Task Force have a smaller percentage with low education qualifications than Training Opportunities. The ethnic composition on each programme also differs. Jobs Plus has a much higher percentage who are European/pakeha, while Community Task Force and Training opportunities have over 30% each who are Maori. Training opportunities also has 21.8% Pasifika which is much higher than for the other programmes. The percentage who are long term unemployed at time  $t$  is very similar for each of the programmes at over 80%. The unemployment patterns over time for each of the programmes, indicates that the post intervention decline is greater for Jobs Plus and Community Task Force than for Training Opportunities.

**Table 5: Summary Statistics**

<b>Variable</b>	<b>Total Sample</b>	<b>Intervention</b>	<b>No Intervention</b>	<b>Jobs Plus</b>	<b>Community Task Force</b>	<b>Training Opportunities</b>
<i>Age</i> as at 1 Jan 1989	39.3	38.6	39.5	38.5	39.4	38.7
<b><i>Education (%)</i>:</b>						
No Formal Qualification	45.2	55.7	44.4	50	52.6	69.2
School Qualification	33.6	30.8	33.7	34.4	33.5	22.0
Post School Qualification	21.2	13.5	21.9	15.6	13.9	8.8
<b><i>Ethnicity (%)</i>:</b>						
European/Pakeha	70.2	60.9	71.0	71.7	57.9	37.2
Maori	17.1	22.4	16.6	17.5	33.0	31.1
Pacific Islander	6.8	11.2	6.5	7.0	5.7	21.8
Other	5.9	5.5	5.9	3.8	3.4	9.9
<b><i>Unemployment Pattern (%)</i>:</b>						
Registered U $t-4$	17.7	22.6	17.3	20.3	25.4	27.1
Registered U $t-3$	19.1	30.6	18.1	28.0	35.1	35.5
Registered U $t-2$	21.4	44.1	19.6	42.2	44	48.3
Registered U $t-1$	21.9	70.7	18	72.8	61.4	68.1
Registered U $t$	18.7	74.6	14.2	72.9	76.9	77.6
Registered U $t+1$	9.5	21.6	8.5	14.3	26.7	36.7
Registered U $t+2$	5.5	11.9	5.0	8.7	10.8	19.3
Registered U $t+3$	3.9	8.6	3.6	7.2	6.7	12.4
Registered Unemployed Pre- $t$	19.8	39.5	18.2	38.3	29.2	42.3
Registered Unemployed Post- $t$	6.3	14.0	5.7	10.1	14.8	22.8
Short Term Unemployed (at $t$ )	82.4	13.5	87.9	11.5	16.3	17.4
Long Term Unemployed (at $t$ )	17.6	86.5	12.1	88.5	83.7	82.6
% of those Receiving Interventions	--	--	100	69.1	5.5	25.5
% of Sample	100	90.5	9.5	6.6	0.5	2.4
<b><i>Number of Observations</i></b>	42,439	38,396	4,043	2,792	222	1,029



## 6. Empirical Model

A number of estimators can be implemented with DID matching, including single nearest-neighbour, multiple nearest-neighbours and local-linear regression. In this study, single nearest-neighbour matching with replacement is used with sensitivity analysis indicating the results are not sensitive to the choice of estimator.

Implementation of the single nearest-neighbour DID matching estimator entails two steps. The first is estimating the propensity score on which the matching is based, as the propensity score is not known a priori. There has been much discussion in the literature as to the variables to include in the participation equation and as yet there is no real consensus, apart from the need to include all those variables that influence both participation and outcomes in the absence of participation (Smith and Todd 2005: 20). The difficulty is that there is no generally accepted formal approach that identifies these variables, and the failure to include all the relevant variables violates the conditional independence assumption. Lechner (1999: 78) suggests that these covariates can be chosen without developing a formal behavioural model, but rather simply by considering the broad 'building blocks' of this behaviour. The decisions as to which variables to include, therefore, should be based on the processes through which programme participation decisions are made. This is the major approach used in the literature and the one utilised here.

Participation in active labour market programmes involves to some extent the input of both the employment advisor and the unemployed individual (Lechner (1999) and Sianesi (2003: 138-9)). Both dimensions to this decision need to be considered. The employment advisor potentially has an impact on the allocation of individuals to active labour market programmes in New Zealand. The employment advisor selects clients for programmes based not only on their unemployment histories, but also on subjective judgements over whether or not there are realistic chances of positive outcomes from these interventions. Factors in the decision-making process include eligibility rules, unemployment and labour market histories, age, education and other capabilities.

As far as the unemployed individual is concerned, the decision of whether or not to participate in a programme might be based on personal assessments of the costs and benefits associated with programme participation. Demographic and human capital factors, labour market histories and external factors may influence these assessments. A number of demographic factors have been used in other matching studies, including age, ethnicity, marital status, and number of children. Age and ethnicity are included in our dataset. Human capital characteristics are also potentially important as they provide information on the educational experiences and capabilities of the unemployed client. Measures of levels of education and qualifications, including work experience and training are often included as variables that influence participation (Sianesi 2003: 138).

The labour force history of the unemployed individual has a major link to participation in active labour market programmes. A number of researchers suggest that this is the key determinant for the unemployed, quite apart from its role as eligibility criterion for administrators (Heckman, Ichimura et al. (1998), Lechner

(1999), Eichler and Lechner (2002), Sianesi (2003) and Smith and Todd (2005)). While labour market history overall is important, the length of time unemployed in the current spell is particularly significant. In the presence of duration dependence, the greater the time an individual is in unemployment the less the likelihood of moving out of that status and into employment, and the greater the likelihood that an individual will participate in a voluntary programme (Sianesi 2003: 138). The importance of the current labour force status is demonstrated in the finding that it is labour force status and the length of time unemployed in the current spell that are the main predictors of participation in active labour market programmes (Heckman, Ichimura et al. (1998: 1032), and Heckman and Smith (2004)). Our dataset contains variables for length of time unemployed both in the year of intervention  $t$  and for each of the four years before this period.

External influences are a fourth category of factors that may alter decisions about participation in active labour market programmes. Should the local labour market be favourable for employment, individuals may delay entering an intervention programme in the hope of finding employment. On the other hand, if participation in an active labour market programme is seen as a form of job search, as in the study of participation in the JTPA programme by Heckman and Smith (2004), then participation in programmes may increase. Although the direction of the influence of local conditions on participation may vary, research indicates that it should be included when estimating participation models (Heckman, Ichimura et al. (1998), Lechner (1999a) and (1999b), Sianesi (2001) and (2003), Hujer, Caliendo et al. (2003) and Heckman and Smith (2004)). We use regional dummies and regional real growth rates in economic activity in our study to proxy for local labour market conditions.

Therefore, the participation model includes variables on age, age squared, dummy variables for educational qualifications and minority ethnic status, unemployment in the year of potential intervention  $t$ , unemployment in the preceding year  $t-1$ , unemployment history in the full pre-intervention period  $t-4$  to  $t-1$ , whether an individual is long term unemployed or not leading into time  $t$ , dummy variables for each region (except the base or excluded region), regional population size dummy variables (with the omitted region being one with a population of less than 25,000) and real regional growth rates.

In the literature on matching, either probit or logit estimation is used to produce propensity score estimates for participation. There is no reason a priori to prefer one estimation technique over the other. Given that probit estimation is used in this study, the propensity score can be written:

$$\Pr(y_i = 1|x_j) = \Phi(\mathbf{x}_j \mathbf{b}) \quad (16)$$

where  $\Phi(\cdot)$  is the standard normal cumulative density function. Rather than reporting the parameter estimates from these regressions, we report the estimated partial derivatives, and their standard errors in the tables to follow. For a continuous explanatory variable, this partial derivative can be written:

$$\frac{\partial \Phi}{\partial x_1} = \phi(\mathbf{x}_j \mathbf{b}) b_1 \quad (17)$$

## 7. Results – Impact of Participation in Programmes on Participants

This section is organised according to the sequence involved in undertaking the matching process. Firstly, the propensity score is estimated and results from the participation equation are presented. Secondly, the effects of participation on participants are estimated and analysed using DID matching with the propensity score used to create the matches. Thirdly, sensitivity analysis is undertaken to identify whether the participants and non-participants are well balanced following matching and to test the robustness of the results to alternative estimation specifications.

### 7.1 Participation Results

The probit results for participation in each of the programmes are reported in Table 6. As is the case in the recent evaluation literature the key determinant of participation in one of the programmes is unemployment at time  $t$ ,  $t-1$  and unemployment history. Unemployment at  $t$  has a positive statistically significant impact on participation in all of the programmes, which is also the case for unemployment at  $t-1$  for both Jobs Plus and Training Opportunities. Unemployment history also has a statistically significant impact on participation for all three programmes, but the effect is negative. There are several reasons why this impact is negative; there may be a discouragement effect, individuals may have received an intervention in a time period prior to the start of the cohort dataset or there may be creaming by administrators. In other words, the greater a person's unemployment over the four years before the year of possible intervention the less likely they are to be on one of the programmes. In summary, recent unemployment increases participation probability, while earlier unemployment reduces it.

Other influences on participation in the programme include education level, ethnicity and regional labour markets. Those with higher levels of education have a lower probability of participating in Training Opportunities than those with lower levels, while the opposite is the situation for Community Task Force. European/pakeha have a higher probability of participating in Jobs Plus than other ethnic groups while the opposite is the case for Training Opportunities. Improvements in the local labour market, measured by the change in real regional growth rate, decrease the probability of participating in a programme, which may be the result of individuals assessing that the better approach is to continue searching for employment than to become involved in a programme.

There is a clear difference between the average propensity score for participants compared with non-participants in each of the programmes. This difference emphasises the importance of estimating the impact of participation on individuals who have similar characteristics.

**Table 6: Participation Estimates for Jobs Plus, Community Task Force and Training Opportunities**

Variable	Jobs Plus		Community Task Force		Training Opportunities	
	dF/dx	P > z	dF/dx	P > z	dF/dx	P > z
Age	0.00061	0.324	-0.00007	0.620	0.00061	0.097
Age Squared	-0.00001	0.085	0.00001	0.725	-0.00001	0.040
Maori	-0.00439	0.000	0.00048	0.031	0.00499	0.000
Pacific Islander	-0.00453	0.000	-0.00016	0.629	0.01372	0.000
Other Ethnic Group	-0.00531	0.000	-0.00037	0.236	0.00934	0.000
School Qualification	0.00048	0.517	0.00025	0.189	-0.00167	0.000
Post School Qualification	-0.00117	0.200	0.00002	0.937	-0.00235	0.000
Unemployment: <i>t</i> -1	0.03202	0.000	0.00029	0.369	0.00571	0.000
Unemployment: <i>t</i>	0.00957	0.000	0.00403	0.000	0.01856	0.000
Unemployment History ( <i>t</i> -4 to <i>t</i> -1)	-0.02391	0.000	-0.00060	0.106	-0.00406	0.000
Long Term Unemployed	0.08573	0.000	0.00067	0.160	0.00045	0.640
Real Regional Growth Rate	-0.00250	0.000	-0.00042	0.001	-0.00126	0.000
Region: <25,001	0.03920	0.000	-0.09255	0.000	0.03517	0.000
Region: 25,000 < Population < 100,000	0.01095	0.011	0.37425	0.000	0.00744	0.060
Average Propensity Score - Participant	0.30393		0.05807		0.17616	
Average Propensity Score - Non-participant	0.03547		0.00542		0.01893	
LR chi2	6644.79		758.92		3071.18	
Prob > Chi2	0.0000		0.0000		0.0000	
Pseudo R2	0.4222		0.2945		0.3652	
Number of Observations	40344		36686		39073	

The base state for level of education is no formal qualification, for ethnicity is European/Pakeha, for long term unemployed is short term unemployed and for region type is regions with a population >99,999.

## 7.2 Impact Results

Estimation of the impact arising from participation in active labour market programmes using DID matching requires two further issues to be addressed. The first is accounting for the extra variance that occurs as a result of the matching process, with the standard approach in the literature being to use bootstrapped standard errors. This approach is used here and is implemented with 100 iterations, as there is minimal variation in the outcome once the iterations increased past 50.

The second issue involves “Ashenfelter’s dip”, wherein earlier studies find that in the period immediately prior to participation in a programme there is a decline in the outcome variable of interest (Ashenfelter (1977) and Ashenfelter and Card (1985)). Upward bias in the estimated impact may arise should the before/after comparison use the period in which the dip occurs in the measure of the outcome before the intervention. Should the dip be a permanent effect then there is no bias. However, should the dip be transitory then bias will result in the estimate. Although the initial work on Ashenfelter’s dip focused on wages and earnings, subsequent research has indicated that there is also evidence of an increase in the propensity to be unemployed in the lead up to participation in a programme (Card and Sullivan (1988), Heckman and Smith (1999) and Bergemann, Fitzenberger et al. (2005)).

The usual approach to this problem is to set the initial time period to avoid the dip. Given that the eligibility criterion for participation in Job Plus and Training Opportunities is 26 weeks and for Community Task Force 13 weeks registered as unemployed, we exclude the year immediately prior to the intervention. The pre-intervention measure of unemployment is, therefore, the average propensity to be unemployed in years  $t-4$ ,  $t-3$  and  $t-2$ .

The DID matching estimator identifies the impact of participation in a programme on the proportion of a year that an individual spends registered as unemployed at a particular year in time. In this study, the years are  $t$ ,  $t+1$ ,  $t+2$  and  $t+3$ . These are discrete estimates for each of those years rather than incremental effects. Their sum, therefore, cannot be interpreted as the cumulative permanent effect of the programme. The long term effect is assumed to be the impact measured at  $t+3$ . Given the estimation time periods utilised in this study it is possible to address a number of questions including contemporaneous, short term, and long term impacts from participation in each of the three programmes.

The results are reported in Table 7. The parameter estimates the change in the proportion of the year registered as unemployed as a result of participating in a particular labour market programme. For example, the estimate for  $t+1$  from participating in Jobs Plus is -0.21016. This indicates that participation in the Jobs Plus subsidy programme reduces the time registered as unemployed for an individual on average by 0.21 of a year (76.7 days) in the year immediately following the intervention.

**Table 7: Estimates of Impact of Participation in Jobs Plus, Community Task Force and Training Opportunities**

Category	<i>T</i>		<i>t+1</i>		<i>t+2</i>		<i>t+3</i>	
	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value
<i>Intervention</i>								
Jobs Plus	-0.00331	0.800	-0.21016	0.000	-0.06512	0.000	0.00252	0.862
Community Task Force	0.00966	0.786	-0.15971	0.002	-0.09881	0.036	-0.02957	0.483
Training Opportunities	-0.01045	0.614	-0.07113	0.005	-0.01561	0.504	0.01803	0.450
<i>Long-term U</i>								
Jobs Plus	-0.00660	0.665	-0.22028	0.000	-0.08409	0.000	-0.02810	0.060
Community Task Force	-0.03356	0.390	-0.21664	0.000	-0.13247	0.011	-0.09350	0.060
Training Opportunities	-0.00306	0.891	-0.05156	0.081	0.01347	0.662	0.03793	0.172
<i>Short-term U</i>								
Jobs Plus	0.04821	0.102	-0.00559	0.849	0.00449	0.914	0.06309	0.064
Training Opportunities	0.02067	0.583	0.01682	0.781	0.01501	0.785	0.00083	0.097
<i>No Formal Qualification</i>								
Jobs Plus	-0.03961	0.021	-0.24913	0.000	-0.10027	0.000	-0.02867	0.150
Community Task Force	-0.02784	0.612	-0.16490	0.028	-0.05407	0.433	-0.00787	0.895
Training Opportunities	0.00779	0.751	-0.07067	0.045	-0.01151	0.719	0.04788	0.136
<i>School Qualification</i>								
Jobs Plus	-0.03271	0.101	-0.22381	0.000	-0.07075	0.002	-0.03222	0.200
Training Opportunities	-0.01899	0.648	-0.08994	0.081	0.00881	0.831	0.02698	0.574
<i>Post School Qualification</i>								
Jobs Plus	-0.03884	0.209	-0.19256	0.000	-0.08404	0.027	-0.03926	0.266
Training Opportunities	0.00282	0.967	-0.09090	0.320	-0.01944	0.813	0.04316	0.612

A concern policy makers have with active labour market programmes, and one that has received attention in the literature, is that “locking-in” effects from participation may occur during the intervention. A locking-in effect is where participants increase their propensity to be unemployed while participating on a programme (Sianesi 2003). The coefficients used to identify whether there is a locking in effect are those for  $t$ . The result for Community Task Force has a positive sign, suggesting locking-in, while those for Jobs Plus and Training Opportunities have a negative sign. In fact, none of the coefficients are statistically significant, suggesting that there is in fact no effect in time  $t$  locking-in or otherwise. The one exception to this is for those with no qualification who participate in Jobs Plus. For this group there is a significant effect in time  $t$ , but they experience a reduction in time registered as unemployed rather than a locking-in effect. In summary, there is no evidence of a locking-in effect from the three programmes.

The results for the impact in each of the programmes are in the first three rows. There is a consistent effect for each programme, with a beneficial effect in  $t+1$ , a smaller effect in  $t+2$  and no statistically significant impact in  $t+3$ . Both Jobs Plus and Community Task Force have beneficial impacts in  $t+2$  but for Training Opportunities the statistically significant beneficial impact only occurs in  $t+1$ . As far as magnitudes of the effects are concerned, Jobs Plus has the strongest effect in  $t+1$  and Community Task Force in  $t+2$ . Training Opportunities has a relatively smaller beneficial effect in  $t+1$  of 0.07 of the year (26 days).

Due to the smaller number of participants in Community Task Force than in Training Opportunities or Jobs Plus it is not possible to undertake analysis for all of the sub-groups in that programme. Nevertheless, there are some interesting results from the sub-group analysis. The long term unemployed benefit more than participants as a whole for all of the programmes. While the effect in  $t+3$  remains statistically insignificant at the 5% level, the  $p$ -value is much lower than for the sample as a whole.

There are also differences in the impacts for education sub-groups across programmes. Training Opportunities has a slightly lower impact in  $t+1$  for those with no qualification than for other education sub-groups. The situation is reversed for Jobs Plus. This could be due to the fact that the Jobs Plus subsidy programme connects the unemployed to the labour market and through this provides the low skilled with work relevant capabilities they did not already possess. The reason that the effect of Training Opportunities is lower for those with the lowest level of qualification may be due to the limited time spent on the programme, 25% of a year. Without a reasonable education base this length of time may well not be sufficient to increase greatly the skill level and employability of that group. However, it may have a stronger impact on those with a higher initial level of education as in the limited time frame it is possible to add value to those existing capabilities. Overall, there is the same pattern of a statistically significant beneficial impact for each of the sub-groups in each programme in  $t+1$  that disappears by  $t+3$ .

### **7.3 Sensitivity Analysis**

Due to the lack of clear theoretical or empirical support for a specific DID estimator the standard approach is to undertake sensitivity analysis on the results. This involves

two steps; establishing whether the participant and matched non-participant groups are balanced after matching and establishing whether the results are sensitive to the DID estimator used.

Matching on the propensity score over the common support removes one potential source of bias, but it does not necessarily ensure that the covariates in the participant and non-participant groups are balanced. (Heckman, Ichimura et al. 1998) point out that failure to balance covariates can produce biased estimates. The bias, standard deviation and *t*-test for each variable in the matched participant and non-participant groups are estimated. In addition the before and after matching mean bias for the sample groups as a whole and the largest and smallest bias are identified and the summary results presented in Table 8. The bias between the participant and non-participant groups decreases greatly after matching. This is demonstrated by the decrease in the magnitude of the mean bias and the size of the largest and smallest bias across the programmes. This analysis indicates that while matching techniques reduce imbalance they do not remove it completely.

The impact of participation in each of the programmes was estimated using 5 nearest neighbours, 15 nearest neighbours and local linear regression to test the sensitivity of results to using single nearest-neighbour DID estimator. (See Table 9) The results indicate that there are only minor differences and no apparent pattern. There are two sets of calculations where the signs differ between the estimators, for Jobs Plus at  $t+3$  and Community Task Force at  $t$ , but all of those estimates are statistically insignificant.

## **8. Conclusion**

In this paper the contemporaneous, short term and longer term impacts on the unemployment propensity of males of three New Zealand active labour market policies have been estimated. Nearest-neighbour DID matching is the estimation technique used and sensitivity analysis has been used to check the robustness of the estimates to alternative estimation approaches.

The results indicate that for all of the programmes there is no statistically significant “locking-in” effect. Further, while all programmes have a beneficial impact upon participants in the year after participation in the programme this effect dissipates over time such that by the third year post intervention there is no statistically significant effect on participants. Both Jobs Plus and Community Task Force have a beneficial effect in the second as well as in the first year after participation, but for Training Opportunities there is no statistically significant effect in the second year and the first year impact is of a relatively small magnitude compared with the other two programmes.

The eligibility criteria for participation in the programmes are for those who are disadvantaged in the labour market including having been registered unemployed for a reasonable period of time. The results indicate that these programmes are more effective for the long term unemployed than for those who have been unemployed for less than 26 weeks. Jobs Plus is more beneficial for those with lower levels of education, while the reverse is the case for Training Opportunities.



**Table 8: Balancing Analysis – Jobs Plus, Community Task Force and Training Opportunities**

Intervention	Unmatched			Matched		
	Mean Bias Unmatched	Smallest Bias Unmatched	Largest Bias Unmatched	Mean Bias Matched	Smallest Bias Matched	Largest Bias Matched
Jobs Plus	14.466	0.02404	248.48	3.197	0.00000	21.82
Community Task Force	19.745	0.03234	239.01	3.959	0.00000	17.09
Training Opportunities	17.747	0.06121	240.21	3.491	0.00000	10.61

**Table 9: Sensitivity of Results to the Difference-in-Differences Estimator Used**

Estimator	<i>t</i>	<i>t</i> +1	<i>t</i> +2	<i>t</i> +3
<i>Jobs Plus</i>				
One to One	-0.00331	-0.21016	-0.06512	0.00252
5 Nearest Neighbours	-0.01658	-0.23369	-0.07306	-0.00612
15 Nearest Neighbours	-0.01358	-0.22805	-0.06935	-0.00308
Local Linear Regression	-0.01644	-0.23516	-0.07837	-0.00738
<i>Community Task Force</i>				
One to One	0.00966	-0.15797	-0.09881	-0.02957
5 Nearest Neighbours	-0.01988	-0.16207	-0.08407	-0.04322
15 Nearest Neighbours	-0.02223	-0.17244	-0.09881	-0.04815
Local Linear Regression	-0.01820	-0.17187	-0.10102	-0.04885
<i>Training Opportunities</i>				
One to One	-0.01045	-0.07113	-0.01561	0.01803
5 Nearest Neighbours	-0.02251	-0.08638	-0.01484	0.01743
15 Nearest Neighbours	-0.01683	-0.08588	-0.01496	0.01795
Local Linear Regression	-0.01520	-0.08096	-0.01411	0.01741

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