



Working Paper No. 11

Cost-Benefit Analysis of the Mainstream Supported Employment Programme 1998

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* This paper was prepared during 1998 by Sarah James when she was a student on placement within the Commission.

Summary

The Mainstream Supported Employment Programme (Mainstream) has been running in its current form for three years. Although Mainstream is considered effective, its costs and benefits to the New Zealand Government are unknown because there has been no economic or financial cost-benefit analysis undertaken.

Prior to outlining the results of an economic and financial cost-benefit analysis of Mainstream, this paper considers the appropriate type of analysis for a study of this sort, and the results of other cost-benefit analyses of supported employment programmes.

The economic analysis indicates positive net benefits from the first year of Mainstream, which accumulate further over time. The financial analysis shows a positive net present value even with comparatively high levels of "dead-weight" or unemployment of former participants. The analysis suggests that "dead-weight" must be kept below 25%, or that the proportion of participants who gain employment through the programme remain above 36%.

Overall, this cost-benefit analysis indicates positive results from the programme for all parties involved, from both economic and financial perspectives. Intangible benefits of the programme, such as attachment to the workforce, greater social participation, increased self esteem, reduced needs for hospitalisation and other health care, and a more diverse and representative state sector, add further to the value of Mainstream.

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Executive Summary

This paper presents a cost-benefit analysis of the Mainstream Supported Employment Programme (Mainstream).

Mainstream funds supernumerary positions in the state sector for people with disabilities. The goal of the programme is to provide people with the skills, practical experience and confidence to win and hold jobs on merit after two years in supported employment. A salary subsidy of 100% is paid for one year and 50% for the second (and final) year. Funding is also available for training participants and supervisors¹.

This cost-benefit analysis incorporates financial and economic perspectives. The financial analysis is from the perspective of the taxpayer through the taxpayer's agents, the Government, and the economic analysis from the perspective of New Zealand society.

The analysis is based on a cohort of 75 hypothetical participants who start in 1998, and follows them through the remaining years of employment. The Net Present Value (NPV) calculation includes years 1-6 and a residual value for years 7-21. Intangibles and hard-to-value items (e.g. attachment to society) are not included in the numerical analysis.

Two important sensitivities are identified in the numerical analysis. These are the number of people who would have gained employment without the use of Mainstream (dead-weight) and the number of people who fail to obtain employment at the end of the programme (lapsing).

Two sets of spreadsheets test the limits of the dead-weight variable. One assumes that there is no dead-weight. The other conservatively assumes that potential participants are as likely as other people on various forms of government support (for a minimum of one year) to gain employment without participating in Mainstream. This ignores the selection criteria of the programme which require that participants have a significant disability and be at a serious disadvantage in gaining employment.

Most costs and benefits were based on the average or "most likely value".

Economic analysis indicates positive net benefits from the first year, which accumulate further over time. The NPV is \$5.9 - 8.4 million after 21 years depending upon the precise assumptions used.

The financial analysis shows a positive NPV, even with comparatively high levels of "dead-weight" or unemployment of former participants. Dead-weight caused the cumulative net benefits to remain negative for longer, taking five years instead of four before there was a positive return. With no dead-weight the total NPV is \$5.5 million, but with dead-weight the total NPV is \$1.8 million, over the 21-year average working life.

These analyses suggest that "dead-weight" must be kept below 25%, or that the proportion of participants who gain employment through the programme should remain above 36%. Research on previous participants, under the old four-year scheme, has found that more than

¹ See SSC Working Paper No. 10 *Mainstream in Context* for a fuller discussion of Mainstream.

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80% are in permanent employment² while, for the 1997/98 year, 73% of participants gained permanent employment.

Overall, this cost-benefit analysis indicates positive results from the programme for all parties involved, from both economic and financial perspectives. Intangible benefits of the programme, such as attachment to the workforce, greater social participation, increased self esteem, reduced needs for hospitalisation and other health care, and a more diverse and representative state sector, add further to the value of Mainstream.

Summary of Results				
		NPV (\$)	Break-even Point (Years)	Internal Rate of Return (%)
Financial analysis	Dead-weight included	\$1,836,346	4-5	37
	No dead-weight	\$5,484,766	3-4	71
Economic analysis (Inefficiency of taxation and dead-weight included)	Most conservative workforce participation estimation	\$6,311,546	1-2	N/A
	Least conservative workforce participation estimation	\$8,393,820	Under 1	N/A ³

² State Services Commission (1997) Enhancing the Mainstream Supported Employment Programme. Wellington: State Services Commission.

³ No Internal Rate of Return can be calculated as there is no negative value.

Introduction

This paper presents the results of an analysis of the costs and benefits of the Mainstream Supported Employment Programme (Mainstream) administered by the State Services Commission.

The paper initially considers the appropriate types of analysis of costs and benefits for a study of this kind. It then reviews the results of other cost-benefit analyses of supported employment programmes and the previous research on Mainstream. The cost-benefit analysis of Mainstream is then conducted, followed by a discussion of the method and key variables. Results are presented with the relevant spreadsheets and tables. The paper concludes with a discussion and recommendations for future directions.

Analysis of Costs and Benefits

There are two different types of analysis of costs and benefits: cost-effectiveness analysis and cost-benefit analysis⁴. Cost-effectiveness analysis identifies costs in monetary terms but states effects in non-monetary terms, while benefit-cost analysis states both costs and benefits in monetary terms.

Chinnery⁵ argues that a single number, such as that produced by the cost-benefit analysis, is not adequate to fully assess the complexity of a rehabilitation programme, because many of the benefits are unquantifiable. By contrast, the cost-effectiveness approach examines the means of achieving the desired benefits for the least cost⁶ and assumes that the benefits of the programme are indisputably worthwhile. Cost-effectiveness analysis is only appropriate when there is agreement that the project outcomes are desirable⁷. Partially because of this, Mishan⁸ argues that a cost-effectiveness analysis is usually inadequate because it cannot be assumed that there is general agreement that the project outcomes are desirable. This paper accepts that logic – it cannot be assumed that the goals of Mainstream are generally accepted within New Zealand society and therefore a cost-effectiveness analysis is inappropriate.

There are two major types of cost-benefit analysis: an economic cost-benefit analysis and a financial cost-benefit analysis. A financial cost-benefit analysis only looks at the monetary costs and benefits for the organisation concerned, whether it is a government agency or a private sector organisation⁹. By contrast, economic analysis includes all real resource costs

⁴ Chinnery, D. (1991) "Costing rehabilitation services" in: Hesketh, B. & Adams, A. (Eds.) *Psychological perspectives on occupational health and rehabilitation*, pp. 426-453, Marrickville, NSW: Harcourt Brace Jovanovich. Treasury Board of Canada (1991) *Program Evaluation Methods*, Communications Division, Treasury Board of Canada.

⁵ Chinnery, (1991) op. cit.

⁶ State Services Commission (1998) *Cost-benefit analysis of EEO in the New Zealand Public Service*, Wellington: State Services Commission and Belkaoui, A. (1986) *Handbook of Management Control Systems*, Quorum Books.

⁷ State Services Commission (1998) op. cit.

⁸ Mishan, E. (1988) *Cost-benefit analysis*, London: Biddles Ltd.

⁹ State Services Commission (1998) op. cit. and Department of Finance, 1991 op. cit.

and benefits to the community¹⁰ but excludes transfer payments such as a job subsidy. Economic analysis is more appropriate in evaluating public projects¹¹.

When evaluating the costs and benefits of a project over time, a discount rate must be used because money available now is more valuable than it will be in the future. At the very least it could be invested to create a larger sum in the future. Discount rates are typically incorporated into cost-benefit analyses using net present value (NPV) calculations. This study uses the 1997/98 capital charge rate (11%) as the discount rate.

When evaluating the economic costs and benefits of a project using money raised from taxation, the cost of that taxation to the economy should be included. There are a number of costs that arise from taxation, the most important of which is the changes in behaviour induced by taxation. This cost is calculated at 18 cents for every dollar spent on taxation¹². Therefore, for every dollar raised through taxation, there is a cost to the economy for the transfer of 18 cents.

Results of Cost and Benefit Analyses of Supported Employment

There have been several analyses undertaken internationally of the costs and benefits of supported employment¹³. Some programmes report a positive financial outcome for the taxpayer¹⁴ but others report a negative cost-benefit ratio¹⁵. However, these results improve when the total benefits to society and a comparison with alternative programmes, such as sheltered workshops, are factored into the equation¹⁶. Problems identified in these studies of supported employment include the low pay and insecurity of the jobs¹⁷, which in turn affects the financial benefits.

Very little work has been undertaken in New Zealand on the costs and benefits of supported employment. The 1995 analysis of Mainstream suggested a favourable financial cost-benefit

¹⁰ State Services Commission (1998) op. cit. and Department of Finance (1991) *Handbook of Cost-benefit analysis*, Canberra: Commonwealth Government Printer.

¹¹ State Services Commission (1998) op. cit.

¹² Diewert, W.E. & Lawrence, D.A. (1994) *The Marginal Costs of Taxation in New Zealand*, Swan Consultants Canberra Pty Ltd.

¹³ Mank, O'Neill, & Jensen (1997) *Quality in Supported Employment: A New Demonstration of the Capabilities of People with Severe Disabilities*, King Country Washington: Department of Community and Human Services; Beyer, S., Goodere, L., & Kilsby, M. (1996) *The Costs and Benefits of Supported Employment Agencies*, Cardiff: Welsh Centre for Learning Disabilities Applied Research Unit; ANUTECH Pty Ltd (1993) *A financial analysis of the costs and returns of the Commonwealth Rehabilitation Service program* (pp. v-vi, 75-77) Canberra: Australian National University; Liu, H.C. (1982) *Minnesota DVR FY 1981 Economic Analyses. A Modified Cost/Benefit Procedure*, Monograph No.5, Minnesota: Minnesota Division of Vocational Rehabilitation.

¹⁴ ANUTECH Pty Ltd (1993) op. cit. and Liu, H. C. (1982) op. cit.

¹⁵ Beyer, Goodere & Kilsby (1996) op. cit. Rusch, Conley & McCaughrin (1993) op. cit. Conley, R., Rusch, F., McCaughrin, W. & Tines, J. (1989) "Benefits and costs of supported employment: An analysis of the Illinois supported employment project", *Journal of applied behaviour analysis*, 22(4) 441-447.

¹⁶ Beyer, Goodere & Kilsby (1996), op. cit.

¹⁷ Beyer, Goodere & Kilsby (1996) op. cit.

ratio¹⁸ but the analysis did not include estimates of the levels of employment lapsing, or dead-weight. Recently the Association for Supported Employment in New Zealand (ASENZ) undertook a pilot study of the costs and benefits of ten New Zealand employment agencies¹⁹. The study found an initial negative cost/benefit ratio from a financial perspective, with the Government getting back 70 cents for every dollar spent. However, after 3.5 years of operation, favourable cost-benefit ratios begin to emerge²⁰.

Previous Research Findings about Mainstream

As noted above, a simple financial cost-benefit analysis was undertaken on the Mainstream Supported Employment Programme in 1995. Research conducted in 1997 into the effectiveness of Mainstream changed the programme from a four to a two-year programme, to allow more people with disabilities to be employed on the programme. It also meant that government agencies were more willing to participate because of the shorter time frame. However, the costs and benefits to the New Zealand Government of the new two-year programme are unknown because no economic or financial cost-benefit analysis has been undertaken.

Project Aim

The aim of the analysis was to determine the projected costs and benefits to the New Zealand Government of the enhanced two-year Mainstream Supported Employment Programme.

Two specific questions were to be addressed:

1. What are the projected costs and benefits of the enhanced two-year Mainstream Programme over the next six years?
2. What is the value of Mainstream in the long term?

The analysis did not set out to evaluate the performance of the programme in the past.

Method

The following steps were taken in the analysis of the costs and benefits of the Mainstream Supported Employment Programme:

1. Development of the comparison case, which is the “do-nothing” alternative implicit in the calculations.
2. Identification of the significant costs and benefits for both the financial cost-benefit analysis and the economic analysis.

¹⁸ State Services Commission (1995) *Mainstream costs and benefits analysis*, Wellington: State Services Commission.

¹⁹ Bennie and Associates (1997) "Supported Employment Programmes Emerging as Cost Effective", *ASENZ Conference Proceedings*. Palmerston North: ASENZ.

²⁰ Bennie & Associates (1997) op. cit.

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3. Calculation or estimation of the most likely values.
4. Extrapolation of the costs and benefits over the next six years, and then a residual value for the remainder of the working life.
5. Calculation of the total Net Present Value (NPV), Internal Rate of Return and the Break-even point of the programme for the future.
6. Analysis of results.

The analysis was done using Microsoft Excel.

The two key variables identified in the analysis are:

- *Dead-weight* – How many participants would have gained employment without the help of Mainstream?
- *Lapsings* – How many participants remain in employment at the completion of the two-year subsidy period?

Seven spreadsheets were developed. The first three of these were economic analyses which viewed the programme from the perspective of New Zealand society. Each economic analysis provides different estimations of the value of workforce participation.

- **Spreadsheet 1:** The value of increased workforce participation was conservatively assumed to be equal to the salary paid to the participant, minus the Mainstream salary subsidy.
- **Spreadsheet 2:** Was less conservative. In the economic analysis the value of the increased work- force participation was assumed to be equal to the value of the salary paid.
- **Spreadsheet 3:** Takes the mid-point between the first two economic analyses. For this analysis it was assumed that the increased workforce participation was equal to the value of the salary paid to the participant less half of any salary subsidy.

Implicitly, these analyses assume that labour is scarce (not surplus) and that the value of leisure forgone is low. Intangibles such as workforce attachment were not included in the analyses. The significant costs and benefits that were identified are shown below in **Table 1**. The effect of the (in)efficiency of taxation is examined in a separate table.

Table 1: Costs and Benefits Identified in Economic Analysis

Costs	Benefits
Training Administration Inefficiency of taxation*	Increase in workforce participation Increased efficiency of taxation*

* Calculated in a separate table.

The remaining four spreadsheets are financial analyses from the perspective of the New Zealand Government, representing the taxpayer. It is assumed that the productive value of the participant is equal to the value of the wages paid, minus the salary subsidy. Therefore, the wages paid by the Government are cancelled out and are not shown in the analysis.

- **Spreadsheets 4 and 5:** Contain what is termed a 'dead-weight' factor. This is the number of people who may have gained employment without the help of Mainstream (discussed in more detail later). One of these spreadsheets looks at the total costs and benefits assuming 75 participants. The other looks at the average costs and benefits for the "average" participant.
- **Spreadsheets 6 and 7:** The next two spreadsheets assume that no participants would have gained employment without Mainstream. Therefore, there is no dead-weight component. Again, one spreadsheet is for the total costs and benefits assuming 75 participants, and the other is based on the costs and benefits for the 'average participant'. The significant costs and benefits are shown in **Table 2**.

Table 2: Cost and Benefits Identified in Financial Analysis

Costs	Benefits
Mainstream salaries GST on salaries Mainstream training (incl. GST) Mainstream administration (incl. GST) Tax lost from benefits	PAYE paid on salaries GST on salaries GST on training costs GST on administration costs Reduced government benefit payment
Minus dead-weight* - tax lost from benefits	Minus dead-weight* - reduced government benefit payment - taxes paid on salaries

* Dead-weight only included in some of the spreadsheets.

The Calculation of Costs and Benefits

For the analysis the project identified an 'average participant' who joined the programme in 1998. The 'average participant' is a statistical model whereby total figures were divided by the size of the survey population to find the average. The information on the 'average participant' was determined using previous research on the Mainstream Supported Employment Programme²¹. The total costs and benefits for the next six years were then calculated using the 'average participant' model. Costs and benefits for years 7-21 were calculated using a residual value. Calculations for the economic analysis are based on figures derived from the financial analysis.

Significant monetary costs and benefits related to the client group were identified. These were calculated using information on average payments; for example, the average payment that is made to a person on the invalid's benefit. These figures are based on the concept that they are the 'most likely value' (except where otherwise stated).

²¹ State Services Commission (1997) op. cit.

The cost-benefit analysis implicitly compares the programme to the 'null case' of not placing the average participant on the programme.

The marginal cost of taxation was based on the research of Diewert and Lawrence²² who found the marginal cost of capital taxation to be around 18%, and this figure has been used in the economic analysis of costs and benefits. It is assumed that there has been no major movement in this figure since the research.

Figures

The most up-to-date figures were used where possible. The figures for Social Welfare and ACC payment levels are based on the 1996-1997 financial year, the exception being the emergency unemployment benefit which is based on the summer of 1997-1998. Figures from the Ministry of Education are based on the projected costs for the 1998 academic year, the exception being the level of student loan write-off which is based on a 1995 figure. The cost of Mainstream administration is based on the budgeted costs for the 1997-1998 financial year. The training costs are based on the actual costs in the 1996-7 financial year and the salaries are based on the average payments made in March 1998.

Total costs include the fixed administration costs plus the variable placement costs per 'average' individual. Because of technical difficulties it is assumed in the total costs that the number of people on the programme is fixed. This is not the real situation because the number of people on the programme fluctuates for a range of reasons – for example, early absorption of the participant into the employing government agency. For this analysis, the number of participants on the programme is assumed to be 75, based on the number in the programme on one day in March 1998.

Personal income tax calculations assumed that the income earned was the only income being earned by the participants. No allowance has been made for the gains the Government would make from the reduced use of Community Service Cards or for any student loan repayments that would be made as a result of the programme. This has the effect of making the analysis conservative, and therefore understating the benefits.

Dead-weight

One of the key variables in the analysis is the number of people who would have gained work even without Mainstream. This has been termed the dead-weight. Two alternative scenarios have been used:

- The first assumes that none of the participants would have gained employment without the help of the programme. This is almost certainly inaccurate, as it is likely that some participants would have gained employment independently.
- The second more conservatively assumes that some participants would have gained employment without the help of Mainstream. This scenario contains a number of assumptions:
 - It is assumed that the participants are no different from the average person living on government support. That is, that the Mainstream Manager is not selective about who

²² Diewert and Lawrence (1994) op. cit.

comes on to the programme. This is clearly not the case, because Mainstream participants must have a significant disability and be at considerable disadvantage in gaining employment.

- It is assumed that the rate at which people would leave employment does not change for the first six years. However, in the NPV calculations for the residual value from year 7 no further increase in dead-weight is allowed for. That is, if participants would not have gained employment independently by year 7, it is assumed that they would never gain employment independently. In reality, the rate at which people gain employment independently decreases over time.
- It is assumed in the dead-weight calculations that participants who independently gain employment never leave employment. This is very conservative.

The vast majority of participants in Mainstream have not been in employment for several years. The dead-weight figures are based on the rate at which people who have been on a form of income support (either Social Welfare or ACC) for one year leave to go into employment in the next 12 months. Where exact values are not known, the best estimate available from the government agencies concerned was used. There was no information for two categories:

- participants who had previously been in tertiary education, and
- participants who had not been on any form of government support (for example, they had a working spouse).

For these examples the calculation conservatively uses the highest dead-weight figure from the other categories. This was the unemployment benefit with 19.3% dead-weight.

As shown in **Table 3**, calculation of the level of dead-weight was achieved by first identifying the participants' source or sources of support before starting Mainstream. These were then multiplied by the average rate at which people (in the general population), who have been receiving these supports for a period of at least one year, leave to enter employment in the next year. This resulted in a weighted value of 12.87% for the dead-weight calculation.

Table 3: Dead-weight Calculations

Category	Means of living of participants prior to Mainstream	% predicted to gain employment within one year after one year in category	Weighted values
Tertiary education	18.03%	19.30%*	3.48%
ACC	13.11%	10.91%	1.43%
Unemployment benefit	27.87%	19.30%	5.38%
Sickness benefit	8.20%	3.30%	0.27%
Invalids benefit	32.79%	1.00%	0.33%
Not on government support	10.29%	19.30%*	1.99%
Dead-weight			12.87%

* No data available, 19.30% taken from the Unemployment benefit.

For the financial analysis, different dead-weight levels were tested. This was done to determine the level of dead-weight which resulted in the NPV result no longer being positive.

Future Employment

Future employment levels were based on the research on the programme carried out in 1997²³, which found that 13.33% of former participants were not in employment but were on benefits. This result needs to be treated with caution, as not all of the questionnaires were returned. Although the study included participants who had been on the programme over many years, those who had been on the programme more recently were over-represented in the analysis because they were easier to contact.

It is assumed that the numbers both in and out of employment remain static. That is, that the number leaving the workforce is balanced by the number returning. This is likely to be an over-estimation of the number of former participants in employment, because those who did not gain employment with the programme probably responded to the questionnaire at a lower rate.

For the financial analysis, different future levels of unemployment were tested. This was done to determine the level of unemployment, after participation in Mainstream, which would result in the NPV result no longer being positive. Of participants who completed the programme in the 1997/98 year, 73% gained permanent employment.

²³ State Services Commission (1997) op. cit.

Duration of Subsidy Payment

It was assumed in the analysis that all participants remained on the subsidy for the full two years. However, some participants leave the programme early without gaining employment, and other participants gain (unsubsidised) employment before the two years are completed.

Net Present Value (NPV)

The discount rate for the NPV was 11%. This was based on the 1997/98 capital charge rate. For the NPV, a residual value for the years 7 to 21 was used. Twenty-one years is the average length of time that present Mainstream participants have until turning 60.

Internal Rate of Return

This was only worked out for the financial analyses as it cannot be calculated without negative values. It includes the residual value calculated for the NPV.

Break-even Point

Also called the pay-back period, this states the number of years before the programme pays for itself. It does not include the discount rate.

Inflation

The effects of inflation have been ignored. The nominal discount rate, which has an inflation component, may have been overstated. However, around 11% is not inconsistent with the 1972 Cabinet-approved real discount rates of 10%, or with Wilkinson's discount rate estimates (Treasury, 1982).

Wage Increases

It is conservatively assumed that the participants will not receive either promotion or any wage increases after the end of the two-year wage subsidy.

Value of Workforce Participation

In the economic analysis the value of workforce participation is included. It is assumed that labour is scarce, so increased employment of Mainstream participants represents an increase in aggregate labour supply. However, it can be argued that the productivity of Mainstream participants is less than the wage paid during the subsidised period, due to factors such as increased training requirements. To test the sensitivity of this assumption the workforce participation has been valued at different levels. For **Spreadsheets 1 and 2** the workforce participation in the economic analysis was valued as being equal to the salary. In **Spreadsheet 3** the workforce participation was valued as being equal to the salary minus 50% of the salary subsidy.

Results

Economic Analysis

Spreadsheets 1, 2 and 3²⁴ show the economic analyses which were done from the perspective of New Zealand society. All the economic analyses show a positive result. This does not include intangible or hard-to-value items such as reduced hospitalisation rates, greater workforce attachment, and increased social participation. Therefore, the benefits of the programme are understated.

Spreadsheet 1: “Economic Analysis: Workforce Participation Equals Salary Minus Salary Subsidy” has an NPV of \$5,900,095. Net benefits are negative for year 1 but are paid back by year 2 when the cumulative net benefits are \$525,623.

Spreadsheet 2: “Economic Analysis: Workforce Participation is Equal to Salary” has an NPV of \$7,982,369.

Spreadsheet 3: “Economic Analysis: Workforce Participation is Equal to Salary Minus 50% of the Salary Subsidy” has an NPV of \$6,941,232.

The above spreadsheets' NPV results do not include the inefficiency of taxation. If this is included, the NPV's are increased by \$411,451. The inefficiency of taxation is relevant to the economic analyses only.

For both **Spreadsheets 2 and 3**, at no point in the analysis are the net benefits negative, with the cumulative net benefits increasing every year. However, there is a decrease in the net benefits over time, as the discount rate and the dead-weight factors have an increasing effect. Because the net benefits are never negative, no Internal Rate of Return can be calculated. When the break-even point is calculated it is found that the programme never runs at a loss. Thus it is zero years before the costs are recovered.

Table 4 (p.15) shows the effects of the inefficiency of taxation. The net benefits of the (in)efficiency of taxation are negative until the third year of the analysis. The cumulative net benefits remain negative for the first six years. However, the NPV for the (in)efficiency of taxation is positive. This will be largely due to the positive net values predicted in years 7 to 21. The initial decrease in efficiency for the first two years is the result of the large job subsidy. However, gains in efficiency are made with the decreased benefit payments over time. This does not have a major impact on the overall economic analysis.

Table 5 (p.20) provides a summary of the most conservative (**Spreadsheet 1**) and least conservative (**Spreadsheet 2**) results.

²⁴ Note, working is not shown for years 7-21 in spreadsheets.

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Table 4

The Effect of Inefficiency of Taxation						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	100%	50%	No	No	No	No
	subsidy	subsidy	subsidy	subsidy	subsidy	subsidy
Costs						
Mainstream salaries	\$1,905,043	\$952,522	\$0	\$0	\$0	\$0
GST on salaries	\$238,130	\$119,065	\$0	\$0	\$0	\$0
Mainstream training (incl. GST)	\$34,480	\$34,480	\$0	\$0	\$0	\$0
Mainstream administration (incl. GST)	\$224,859	\$224,859	\$0	\$0	\$0	\$0
Inefficiency of taxation at 18%	\$432,452	\$236,567	\$0	\$0	\$0	\$0
Benefits						
Reduced government benefit payout	\$875,683	\$875,683	\$758,955	\$758,955	\$758,955	\$758,955
Minus the dead-weight	\$112,700	\$210,896	\$256,937	\$321,547	\$377,841	\$426,891
Increased efficiency of taxation at 18%	\$137,337	\$119,662	\$90,363	\$78,733	\$68,600	\$59,772
Net benefit	-\$295,115	-\$119,905	\$90,363	\$78,733	\$68,600	\$59,772
Net benefit (cum)	-\$295,115	-\$415,020	-\$324,657	-\$245,924	-\$177,323	-\$117,552
Discount rate	-\$265,870	-\$97,318	\$66,073	\$51,864	\$40,711	\$31,956
NPV (Years 1-21)	\$411,451					

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Spreadsheet 1

Economic analysis of total costs and benefits of Mainstream with 75 participants

Workforce participation is equal to salary minus salary subsidy

	Year 1 100% subsidy	Year 2 50% subsidy	Year 3 No subsidy	Year 4 No subsidy	Year 5 No subsidy	Year 6 No subsidy
Costs						
Mainstream training (incl. GST)	\$34,480	\$34,480	\$0	\$0	\$0	\$0
Mainstream administration (incl. GST)	\$224,859	\$224,859	\$0	\$0	\$0	\$0
Total costs	\$259,340	\$259,340	\$0	\$0	\$0	\$0
Total costs (cum.)	\$259,340	\$518,679	\$518,679	\$518,679	\$518,679	\$518,679
Benefits						
Gross workforce participation	\$0	\$952,522	\$1,651,101	\$1,651,101	\$1,651,101	\$1,651,101
Minus the dead-weight	\$0	\$229,402	\$558,965	\$699,523	\$821,991	\$928,697
Net workforce participation	\$0	\$723,120	\$1,092,136	\$951,578	\$829,110	\$722,404
Total benefits	\$137,337	\$842,781	\$1,182,499	\$1,030,312	\$897,710	\$782,175
Total benefits (cum.)	\$137,337	\$980,118	\$2,162,618	\$3,192,929	\$4,090,640	\$4,872,815
Net benefit (total benefits - total costs)	-\$122,003	\$583,442	\$1,182,499	\$1,030,312	\$897,710	\$782,175
Net benefit (cum)	-\$122,003	\$461,439	\$1,643,938	\$2,674,250	\$3,571,960	\$4,354,135
Discount rate 11% (PV)	-\$109,912	\$473,534	\$864,633	\$678,698	\$532,747	\$418,183
NPV (Years 1-21)	\$5,900,095					

Cost-Benefit Analysis of the Mainstream Supported Employment Programme 1998

Spreadsheet 2

Economic analysis of total costs and benefits of Mainstream with 75 participants

Workforce participation is equal to salary

	Year 1 100% subsidy	Year 2 50% subsidy	Year 3 No subsidy	Year 4 No subsidy	Year 5 No subsidy	Year 6 No subsidy
Costs						
Mainstream training (incl. GST)	\$34,480	\$34,480	\$0	\$0	\$0	\$0
Mainstream administration (incl. GST)	\$224,859	\$224,859	\$0	\$0	\$0	\$0
Total costs	\$259,340	\$259,340	\$0	\$0	\$0	\$0
Total costs (cum.)	\$259,340	\$518,679	\$518,679	\$518,679	\$518,679	\$518,679
Benefits						
Gross workforce participation	\$1,905,043	\$1,905,043	\$1,651,101	\$1,651,101	\$1,651,101	\$1,651,101
Minus the dead-weight	\$245,179	\$458,804	\$558,965	\$699,523	\$821,991	\$928,697
Net workforce participation	\$1,659,864	\$1,446,239	\$1,092,136	\$951,578	\$829,110	\$722,404
Total benefits	\$1,797,201	\$1,565,901	\$1,182,499	\$1,030,312	\$897,710	\$782,175
Total benefits (cum.)	\$1,797,201	\$3,363,102	\$4,545,601	\$5,575,913	\$6,473,623	\$7,255,798
Net benefit (total benefits - total costs)	\$1,537,861	\$1,306,562	\$1,182,499	\$1,030,312	\$897,710	\$782,175
Net benefit (cum)	\$1,537,861	\$2,844,423	\$4,026,922	\$5,057,234	\$5,954,944	\$6,737,119
Discount rate 11% (PV)	\$1,385,461	\$1,060,435	\$864,633	\$678,698	\$532,747	\$418,183
NPV (Years 1-21)	\$7,982,369					

Cost-Benefit Analysis of the Mainstream Supported Employment Programme 1998

Spreadsheet 3

Economic analysis of total costs and benefits of Mainstream with 75 participants

Workforce participation is equal to salary minus 50% of the salary subsidy

	Year 1 100% subsidy	Year 2 50% subsidy	Year 3 No subsidy	Year 4 No subsidy	Year 5 No subsidy	Year 6 No subsidy
Costs						
Mainstream training (incl. GST)	\$34,480	\$34,480	\$0	\$0	\$0	\$0
Mainstream administration (incl. GST)	\$224,859	\$224,859	\$0	\$0	\$0	\$0
Total costs	\$259,340	\$259,340	\$0	\$0	\$0	\$0
Total costs (cum.)	\$259,340	\$518,679	\$518,679	\$518,679	\$518,679	\$518,679
Benefits						
Gross workforce participation	\$952,522	\$1,428,782	\$1,651,101	\$1,651,101	\$1,651,101	\$1,651,101
Minus the dead-weight	\$122,590	\$344,103	\$558,965	\$699,523	\$821,991	\$928,697
Net workforce participation	\$829,932	\$1,084,680	\$1,092,136	\$951,578	\$829,110	\$722,404
Total benefits	\$967,269	\$1,204,341	\$1,182,499	\$1,030,312	\$897,710	\$782,175
Total benefits (cum.)	\$967,269	\$2,171,610	\$3,354,109	\$4,384,421	\$5,282,131	\$6,064,307
Net benefit (total benefits - total costs)	\$707,929	\$945,002	\$1,182,499	\$1,030,312	\$897,710	\$782,175
Net benefit (cum)	\$707,929	\$1,652,931	\$2,835,430	\$3,865,742	\$4,763,452	\$5,545,627
Discount rate 11% (PV)	\$637,774	\$766,985	\$864,633	\$678,698	\$532,747	\$418,183
NPV (Years 1-21)	\$6,941,232					

Financial Analysis

The NPV for all the different scenarios shows that the benefits outweigh the costs.

Spreadsheet 4 shows that the “Total Costs and Benefits of Mainstream with 75 Participants” has an NPV of \$1.8 million. The net benefits change from negative to positive in Year 3. The cumulative net benefits become positive in Year 5. These results include a dead-weight level of 12.87% in Years 1-6 and no further increase in dead-weight from Year 7.

In this spreadsheet the limits of the two key assumptions were tested. It was found that the level of dead-weight that would result in a negative NPV result was 23.87%. This spreadsheet also assumes that 13.33% of participants would not gain employment at the end of the two years of subsidy. It was found that the NPV would remain positive as long as a minimum of 36% of participants became employed at the end of the subsidy period.

Spreadsheet 5: “Costs and Benefits of the Average Mainstream Placement” shows a per-participant average NPV of \$23,822. This also shows that the net benefits become positive at year 3 and the cumulative net benefits do so in year 5.

Spreadsheet 6: “Total Costs and Benefits of Mainstream with 75 Participants. No Dead-weight” has an NPV of \$5.5 million. This is larger than that in the more conservative spreadsheet 2 as it does not contain a dead-weight component. The net benefits become positive in year 3 and the cumulative benefits do so in year 4.

Spreadsheet 7: “Costs and Benefits of the Average Mainstream Placement. No Dead-weight” shows that, per participant, the average NPV is \$73,130. The net benefits become positive in year 3 and the cumulative net benefits do so in year 4.

In all these spreadsheets the high level of the NPV is partially due to the benefits that would accrue in years 7 to 21.

Cost-Benefit Analysis of the Mainstream Supported Employment Programme 1998

The summary of the results is in **Table 5**.

Table 5: Summary of Results

		NPV (\$)	Break-even Point (Years)	Internal Rate of Return (%)
Financial analysis	Dead-weight included	\$1,836,346	4-5	37
	No dead-weight	\$5,484,766	3-4	71
Economic analysis (inefficiency of taxation and dead-weight included)	Most conservative workforce participation estimation	\$6,311,546	1-2	N/A
	Least conservative workforce participation estimation	\$8,393,820	0	N/A

Cost-Benefit Analysis of the Mainstream Supported Employment Programme 1998

Spreadsheet 4: Total costs and benefits of Mainstream with 75 participants

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	100% subsidy	50% subsidy	No subsidy	No subsidy	No subsidy	No subsidy
Costs						
Mainstream salaries	\$1,930,787	\$965,393	\$0	\$0	\$0	\$0
GST on salaries	\$241,348	\$120,674	\$0	\$0	\$0	\$0
Mainstream training (incl. GST)	\$34,480	\$34,480	\$0	\$0	\$0	\$0
Mainstream administration (incl. GST)	\$224,859	\$224,859	\$0	\$0	\$0	\$0
Total Mainstream costs	\$2,431,474	\$1,345,407	\$0	\$0	\$0	\$0
Tax lost on benefits	\$151,632	\$151,632	\$131,419	\$131,419	\$131,419	\$131,419
Minus the dead-weight	\$19,515	\$36,518	\$44,491	\$55,679	\$65,426	\$73,920
Total tax lost on benefits	\$132,117	\$115,114	\$86,929	\$75,741	\$65,993	\$57,500
Total costs	\$2,563,591	\$1,460,521	\$86,929	\$75,741	\$65,993	\$57,500
Total costs (cum.)	\$2,563,591	\$4,024,112	\$4,111,041	\$4,186,782	\$4,252,775	\$4,310,274
Benefits						
Reduced government benefit payment	\$875,683	\$875,683	\$758,955	\$758,955	\$758,955	\$758,955
Minus the dead-weight	\$112,700	\$210,896	\$256,937	\$321,547	\$377,841	\$426,891
Total reduction on benefit payments	\$762,983	\$664,787	\$502,018	\$437,408	\$381,114	\$332,064
Tax paid on salaries						
GST	\$231,348	\$120,674	\$0	\$0	\$0	\$0
PAYE including ACC payment	\$438,165	\$438,165	\$379,758	\$379,758	\$379,758	\$379,758
GST on training costs	\$4,310	\$4,310	\$0	\$0	\$0	\$0
GST on administration	\$28,107	\$28,107	\$0	\$0	\$0	\$0
Minus the dead-weight	\$56,392	\$105,526	\$128,563	\$160,892	\$189,060	\$213,603
Total tax on salaries	\$655,539	\$485,731	\$251,194	\$218,866	\$190,698	\$166,155
Total benefits	\$1,418,522	\$1,150,518	\$753,212	\$656,274	\$571,811	\$498,219
Total benefits (cum.)	\$1,418,522	\$2,569,040	\$3,322,252	\$3,978,525	\$4,550,336	\$5,048,555
Net benefit (total benefits - total cost)	-\$1,145,069	-\$310,003	\$666,283	\$580,533	\$505,818	\$440,719
Net benefit (cum)	-\$1,145,069	-\$1,455,072	-\$788,789	-\$208,256	\$297,562	\$738,281
Discount rate 11%	-\$1,031,594	-\$251,605	\$487,181	\$382,415	\$300,178	\$235,627
NPV (Years 1-21)	\$1,836,346					

Cost-Benefit Analysis of the Mainstream Supported Employment Programme 1998

Spreadsheet 5: Costs and benefits of the average Mainstream placement

	Year 1 100% subsidy	Year 2 50% subsidy	Year 3 No subsidy	Year 4 No subsidy	Year 5 No subsidy	Year 6 No subsidy
Costs						
Mainstream salaries	\$25,744	\$12,872	\$0	\$0	\$0	\$0
GST on salaries	\$3,218	\$1,609	\$0	\$0	\$0	\$0
Mainstream training (incl. GST)	\$460	\$460	\$0	\$0	\$0	\$0
Mainstream administration (incl. GST)	\$2,998	\$2,998	\$0	\$0	\$0	\$0
Total Mainstream costs, per placement	\$32,420	\$17,939	\$0	\$0	\$0	\$0
Tax lost on benefits	\$2,022	\$2,022	\$1,759	\$1,759	\$1,759	\$1,759
Minus the dead-weight	\$260	\$487	\$595	\$745	\$876	\$989
Total tax lost on benefits	\$1,762	\$1,535	\$1,163	\$1,014	\$883	\$770
Total costs	\$34,181	\$19,474	\$1,163	\$1,014	\$883	\$770
Total costs (cum.)	\$34,181	\$53,655	\$54,818	\$55,832	\$56,715	\$57,485
Benefits						
Reduced government benefit payment	\$11,676	\$11,676	\$10,119	\$10,119	\$10,119	\$10,119
Minus the dead-weight	\$1,503	\$2,812	\$3,426	\$4,287	\$5,038	\$5,692
Total reduction on benefit payments	\$10,173	\$8,864	\$6,694	\$5,832	\$5,082	\$4,428
Tax paid on salaries						
GST	\$3,218	\$1,609	\$0	\$0	\$0	\$0
PAYE including ACC payment	\$5,842	\$5,842	\$5,063	\$5,063	\$5,063	\$5,063
GST on training costs	\$57	\$57	\$0	\$0	\$0	\$0
GST on administration	\$375	\$375	\$0	\$0	\$0	\$0
Minus the dead-weight	\$752	\$1,407	\$1,714	\$2,145	\$2,521	\$2,848
Total tax on salaries	\$8,366	\$6,102	\$3,349	\$2,918	\$2,543	\$2,215
Total benefits	\$18,539	\$14,965	\$10,043	\$8,750	\$7,624	\$6,643
Total benefits (cum.)	\$18,539	\$33,504	\$43,547	\$52,297	\$59,922	\$66,565
Net benefit (total benefits - total cost)	-\$15,642	-\$4,508	\$8,879	\$7,737	\$6,741	\$5,873
Net benefit (cum)	-\$15,642	-\$20,151	-\$11,271	-\$3,535	\$3,206	\$9,080
Discount rate 11%	-\$14,092	-\$3,659	\$6,493	\$5,096	\$4,000	\$3,140
NPV (Years 1.21)	\$23,822					

Cost-Benefit Analysis of the Mainstream Supported Employment Programme 1998

Spreadsheet 6: Total costs and benefits of Mainstream with 75 participants. No dead-weight

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	100% subsidy	50% subsidy	No subsidy	No subsidy	No subsidy	No subsidy
Costs						
Mainstream salaries	\$1,930,787	\$965,393	\$0	\$0	\$0	\$0
GST on salaries	\$241,348	\$120,674	\$0	\$0	\$0	\$0
Mainstream training (incl. GST)	\$34,480	\$34,480	\$0	\$0	\$0	\$0
Mainstream administration (incl. GST)	\$224,859	\$224,859	\$0	\$0	\$0	\$0
Total Mainstream costs	\$2,431,474	\$1,345,407	\$0	\$0	\$0	\$0
Tax lost on benefits	\$151,632	\$151,632	\$131,419	\$131,419	\$131,419	\$131,419
Total costs	\$2,583,106	\$1,497,039	\$131,419	\$131,419	\$131,419	\$131,419
Total costs (cum.)	\$2,583,106	\$4,080,146	\$4,211,565	\$4,342,984	\$4,474,404	\$4,605,823
Benefits						
Reduced government benefit payment	\$875,683	\$875,683	\$758,955	\$758,955	\$758,955	\$758,955
Tax paid on salaries						
GST	\$241,348	\$120,674	\$0	\$0	\$0	\$0
PAYE including ACC payment	\$438,165	\$438,165	\$379,758	\$379,758	\$379,758	\$379,758
GST on training costs	\$4,310	\$4,310	\$0	\$0	\$0	\$0
GST on administration	\$28,107	\$28,107	\$0	\$0	\$0	\$0
Total tax on salaries	\$683,823	\$563,149	\$379,758	\$379,758	\$379,758	\$379,758
Total benefits	\$1,559,507	\$1,438,833	\$1,138,712	\$1,138,712	\$1,138,712	\$1,138,712
Total benefits (cum.)	\$1,559,507	\$2,998,339	\$4,137,052	\$5,275,764	\$6,414,477	\$7,553,189
Net benefit (total benefits - total cost)	-\$1,023,600	-\$58,206	\$1,007,293	\$1,007,293	\$1,007,293	\$1,007,293
Net benefit (cum)	-\$1,023,600	-\$1,081,806	-\$74,513	\$932,780	\$1,940,073	\$2,947,366
Discount rate 11%	-\$922,162	-\$47,242	\$736,524	\$663,535	\$597,779	\$538,540
NPV (Years 1-21)	\$5,484,766					

Cost-Benefit Analysis of the Mainstream Supported Employment Programme 1998

Spreadsheet 7: Costs and benefits of the average Mainstream placement. No dead-weight

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	100% subsidy	50% subsidy	No subsidy	No subsidy	No subsidy	No subsidy
Costs						
Mainstream salaries	\$25,744	\$12,872	\$0	\$0	\$0	\$0
GST on salaries	\$3,218	\$1,609	\$0	\$0	\$0	\$0
Mainstream training (incl. GST)	\$460	\$460	\$0	\$0	\$0	\$0
Mainstream administration (incl. GST)	\$2,998	\$2,998	\$0	\$0	\$0	\$0
Total Mainstream costs	\$32,420	\$17,939	\$0	\$0	\$0	\$0
Tax lost on benefits	\$2,022	\$2,022	\$1,752	\$1,752	\$1,752	\$1,752
Total costs	\$34,441	\$19,961	\$1,752	\$1,752	\$1,752	\$1,752
Total costs (cum.)	\$34,441	\$54,402	\$56,154	\$57,906	\$59,659	\$61,411
Benefits						
Reduced government benefit payment	\$11,676	\$11,676	\$10,119	\$10,119	\$10,119	\$10,119
Tax paid on salaries						
GST	\$3,218	\$1,609	\$0	\$0	\$0	\$0
PAYE including ACC payments	\$5,842	\$5,842	\$5,063	\$5,063	\$5,063	\$5,063
GST on training costs	\$57	\$57	\$0	\$0	\$0	\$0
GST on administration	\$375	\$375	\$0	\$0	\$0	\$0
Total tax on salaries	\$9,118	\$7,509	\$5,063	\$5,063	\$5,063	\$5,063
Total benefits	\$20,793	\$19,184	\$15,183	\$15,183	\$15,183	\$15,183
Total benefits (cum.)	\$20,793	\$39,978	\$55,161	\$70,344	\$85,526	\$100,709
Net benefit (total benefits - total cost)	-\$13,648	-\$776	\$13,431	\$13,431	\$13,431	\$13,431
Net benefit (cum)	-\$13,648	-\$14,424	-\$994	\$12,437	\$25,868	\$39,298
Discount rate 11%	-\$12,295	-\$630	\$9,820	\$8,847	\$7,970	\$7,181
NPV (Years 1-21)	\$73,130					

Discussion

The inclusion of hard-to-value items is beyond the scope of this analysis because there have been no studies on which to base estimates of these items. The other excluded items are the intangibles. For a complete analysis both these factors need to be valued, because they have significant value for individuals, their families, the department, the Government and society.

The individual gains the advantages of a larger income (which increases not only luxuries, but also intangibles such as independence). Other intangibles for the individual have been found to be related to citizenship, increased self-esteem, hope and enjoyment of life²⁵. If there is a family involved, there is the benefit of having working behaviour modelled for future generations, greater social status and greater opportunities for the family.

Also ignored in the economic analysis is the benefit to government agencies of having a more diverse workforce and gaining valuable employees with a proven ability to fulfil the needs of the position. The research also showed that the government agencies gained other benefits such as improved human performance management skills²⁶.

For the Government there are advantages with hard-to-value items, on which there has been no quantitative study but for which large amounts of qualitative evidence exist. Supported employment is thought to reduce levels of hospitalisation and drug use, as well as the use of activity and sheltered workshop programmes²⁷.

Society benefits by being better able to incorporate people with disabilities, and by accepting diversity. There is also evidence that supported employment reduces the likelihood of premature death²⁸.

Most of the values in the analysis were based on the most likely value, the exceptions being the dead-weight and, possibly, the rate of future employment.

The lack of information about the value of workforce participation by the participants was the major problem encountered for the economic analysis. The three different spreadsheets provided different estimates. Spreadsheet 1 was very conservative, almost certainly understating the value of workforce participation. Spreadsheet 2 was much less conservative and it is probable that, for the first two years, it overstates the value of workforce participation. It is likely that Spreadsheet 3 is the closest to the actual value of workforce participation, with its estimate sitting mid-way between those of Spreadsheets 1 and 2. However, the result was not particularly sensitive to this variable, with large positive NPV's still being suggested by all three spreadsheets.

As there was insufficient information on which to make an estimate of the most likely level of dead-weight, two scenarios were put forward to test the sensitivity of the financial analysis to this variable. The first is very conservative in that it assumes the programme does not have

²⁵ State Services Commission (1997) op. cit.

²⁶ State Services Commission (1997) op. cit.

²⁷ State Services Commission (1997) op. cit. Garth Bennie (1998) Personal communication.

²⁸ State Services Commission (1997) op. cit.

effective selection criteria. The selection criteria are that participants must have a disability and be at significant disadvantage in gaining employment. It is well established that people with a disability are much less likely to be employed than other groups. The conservative scenario assumes that the participants are not different from other people who have been on government paid benefits or income maintenance for a period of one year. Unfortunately for the accuracy of this figure, there was no information about two categories of participants (those who were not on any form of government support and those who were in tertiary education). The second scenario assumes that no participant would gain employment without Mainstream. The results showed that, for both scenarios, there was a positive financial result, although it is more positive for the less conservative scenario. When the limits were tested it was shown that, even with a much higher level of dead-weight, the outcome remains positive up to a value of 23%.

The other variable in the analysis which may not be the most likely value was the level of future employment. This is because it is likely that those who had a more successful outcome would be more likely to respond to the research survey. This research found that over 80% of former participants were employed. When the limits were investigated it was found that, even if the level of unemployment at the completion of the programme was more than doubled, there would still be a positive net value. It was found that, if a minimum of 36% of former participants were employed, there would still be a positive NPV. This suggests that, in the long term, the programme can definitely expect a positive result.

Future Directions

There is a lack of reliable data with which to accurately assess all aspects of the programme. Further analysis would help to resolve some of the issues discussed above and to increase the reliability of the results. This would include:

- gaining more accurate and fuller information about the Mainstream participants
- identifying and quantifying the hard-to-value items
- gaining more information about the cost to the Government and society of maintaining people on benefits, and
- identifying the real level of dead-weight.

The criteria for admission need to ensure that the dead-weight level does not become excessive (above 23%).

The future level of employment needs to be kept above 36%.

There are benefits of Mainstream for individuals and their families, the government agencies involved, and for government and society in terms of the intangible and tangible effects.

From either an economic or a financial perspective, the Mainstream Employment Programme is a positive and effective programme with considerable benefits.

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