Effects of Norwegian Vocational Rehabilitation Programs:

Improving Employability and Preventing Disability?

Lars Westlie

List of all the variables used in the analysis

The table below presents all the variables used in the statistical model together with a short description. A more thorough explanation and motivation of the most important variables are presented in the paper; section 4.1 and Appendix 1. When describing the program effects, the different programs are indicated by numbers in the following way: WS=1, WTO=2, WTP=3, AMO=4, EDU=5.

Table A4
The variables

<table>
<tr><th>Variable</th><th>Description</th></tr>
<tr><td></td><td><u>After-program effects</u></td></tr>
<tr><td>after_prog
(1-10)</td><td>A set of 10 dummies, representing the after-program effect of the five programs as described below. I.e. how the programs affect the hazard rates after program completion.

<table>
<tr><th>Nr</th><th>Program</th><th>Nr</th><th>Program</th></tr>
<tr><td>1</td><td>WS as a single program</td><td>6</td><td>WS as the last of several</td></tr>
<tr><td>2</td><td>WTO as a single program</td><td>7</td><td>WTO as the last of several</td></tr>
<tr><td>3</td><td>WTP as a single program</td><td>8</td><td>WTP as the last of several</td></tr>
<tr><td>4</td><td>AMO as a single program</td><td>9</td><td>AMO as the last of several</td></tr>
<tr><td>5</td><td>EDU as a single program</td><td>10</td><td>EDU as the last of several</td></tr>
</table>

The dummies 6-10 capture the effects of the last program attended in addition to all the previous ones. The reference is not having any program experience.</td></tr>
<tr><td></td><td><u>Heterogeneous after-program effects</u></td></tr>
<tr><td>after_diag
(1-5)</td><td>A set of five dummies capturing the interaction part between each of the five programs and general medical diagnoses. That is, all other diagnoses than mental diagnoses and muscular- and skeleton diagnoses (i.e. group 1,2 and 3 in the diagnosis variable reported below). The reference is muscular- and skeleton diagnoses.</td></tr>
<tr><td>after_male
(1-5)</td><td>A set of five dummies capturing the interaction part between each of the five programs and the male gender. I.e. it captures the extra effect for males relative to females.</td></tr>
<tr><td>after_unemployed
(1-5)</td><td>A set of five dummies capturing the interaction part between each of the five programs and the pre-VR state called unemployed. The reference is the after program effect of persons with long-term illness.</td></tr>
<tr><td>after_old
(1-5)</td><td>A set of five dummies capturing the additional after program effect for persons older than 44 relative to persons aged 30 to 44.</td></tr>
</table>

Table A4
The variables

Variable	Description
after_mental (1-5)	A set of five dummies capturing the interaction part between each of the five programs and mental diagnoses. The reference is muscular- and skeleton diagnoses. This interaction part does not differ between single and several programs.
after_short-ill (1-5)	A set of five dummies capturing the interaction part between each of the five programs and the pre-VR state called short term illness. The reference is the after program effect of persons with long-term illness.
after_little-exp (1-5)	A set of five dummies capturing the interaction part between each of the five programs and persons with little previous work experience, defined as having less than the 25'th percentile of persons at the same age (see the age_work-exp variable reported below for a detailed overview). The reference is participants with more work experience than the 25'th percentile.
after_young (1-5)	A set of five dummies capturing the additional after program effect for persons younger than 30 relative to persons aged 30 to 44.
a1_bc - a5_bc	Five interactions between each of the five programs and the local business cycle (measured as deviation from the mean)
a1_dep-rate – a5_dep-rate	These five variables are interaction-parts between the program effects and time since completion (in months), capturing the depreciation rate of the programs.
a1_education – a5_education	Five interactions between each of the five programs and the number of years of previous education (measured as deviation from the mean).
	<u>On-program effects</u>
on_program (1-5)	A set of 10 dummies, representing the on program effect of the five programs as described below, i.e. how the programs affect the hazard rates while participating.

Nr	Program	Nr	Program
1	WS as a single program	6	WS as the last of several
2	WTO as a single program	7	WTO as the last of several
3	WTP as a single program	8	WTP as the last of several
4	AMO as a single program	9	AMO as the last of several
5	EDU as a single program	10	EDU as the last of several

The dummies 6-10 capture the effects of the last program attended in addition to all the previous ones.

	<u>Heterogeneous on-program effects</u>
on_diag (1-5)	A set of five dummies capturing the interaction part between each of the five programs and general medical diagnoses. That is, all other diagnoses than mental diagnoses and muscular- and skeleton diagnoses (i.e. group 1,2 and 3 in the diagnosis variable reported below). The reference is muscular- and skeleton diagnoses.
on_male (1-5)	A set of five dummies capturing the interaction part between each of the five programs and the male gender. I.e. the extra effect for males relative to females.
on_unemployed (1-5)	A set of five dummies capturing the interaction part between each of the five programs and the pre-VR state called unemployed. The reference is the after program effect of persons with long-term illness.

Table A4
The variables

Variable	Description
on_old (1-5)	A set of five dummies capturing the additional after program effect for persons older than 44 relative to persons aged 30 to 44.
on_mental (1-5)	A set of five dummies capturing the interaction part between each of the five programs and mental illness diagnoses. The reference is muscular- and skeleton diagnoses. This interaction part does not differ between single and several programs.
on_short-ill (1-5)	A set of five dummies capturing the interaction part between each of the five programs and the pre-VR state called short term illness. The reference is the after program effect of persons with long-term illness.
on_little-exp (1-5)	A set of five dummies capturing the interaction part between each of the five programs and persons with little previous work experience, defined as having less than the 25'th percentile of persons at the same age (see the age_work-exp variable reported below for a detailed overview). The reference is participants with more work experience than the 25'th percentile.
on_young (1-5)	A set of five dummies capturing the additional after program effect for persons younger than 30 relative to persons aged 30 to 44.
on1_bc – on5_bc	Five interactions between each of the five programs and the local business cycle (measured as deviation from the mean)
on1_education – on5_education	Five interactions between each of the five programs and the number of years of previous education (measured as deviation from the mean).
	Instruments
z1-training	The share of new training programs. This is calculated as the number of new available program slots in WS, WTO and WTP in the previous month within a region, divided by the number of applicants who are waiting for a new program.
z2-amo	The share of new AMO courses. This is calculated as the number of new available AMO slots in the previous month within a region, divided by the number of applicants who are waiting for a new program.
z3-work-pressure	This instrument is called work pressure on the caseworker and calculated as the relative change in the inflow of new VR candidates relative to the average inflow in the three previous months.
	Duration and calendar time

Table A4
The variables

<table>
<tr><th>Variable</th><th>Description</th></tr>
<tr><td>spell-duration
(1-36)</td><td>A set of 36 dummy variables capturing the effect of spell duration. These dummies are constructed as follows.
<table>
<tr><th>Duration (in months)</th><th>Dummy number</th><th>Description</th></tr>
<tr><td>1 – 2</td><td>1 – 2</td><td>One dummy for each duration month in this interval.</td></tr>
<tr><td>3 – 71</td><td>3 – 35</td><td>One dummy for each second month of duration in this interval. I.e. dummy number 3 captures the effect of three or four month duration, while dummy number 35 captures the effect of 70 and 71 month duration.</td></tr>
<tr><td>72 +</td><td>36</td><td>One dummy capturing the effect of more than 71 month duration.</td></tr>
</table>
The reference is the first month in the spell, i.e. dummy number one. These dummies are only included in the outcome equation (see section 4.1 in the paper)</td></tr>
<tr><td>DP-duration
(1-12)</td><td>A set of twelve dummies, capturing the effect of consecutive months in the DP state. That is, either time since spell start or time since the completion of the last program. Each dummy captures the effect of two and two month in the DP state.
<table>
<tr><th>Nr</th><th>Consecutive months in DP</th><th>Nr</th><th>Consecutive months in DP</th><th>Nr</th><th>Consecutive months in DP</th></tr>
<tr><td>1</td><td>1-2</td><td>5</td><td>9-10</td><td>9</td><td>17-18</td></tr>
<tr><td>2</td><td>3-4</td><td>6</td><td>11-12</td><td>10</td><td>19-20</td></tr>
<tr><td>3</td><td>5-6</td><td>7</td><td>13-14</td><td>11</td><td>21-22</td></tr>
<tr><td>4</td><td>7-8</td><td>8</td><td>15-16</td><td>12</td><td>23+</td></tr>
</table>
Dummy number 1 is the reference. These dummies are only included in the participation equation.</td></tr>
<tr><td>year
(1-10)</td><td>A set of ten dummy variables indicating the current calendar year. 1=1994, 10=2003. Number 5 (1998) is the reference.</td></tr>
<tr><td>month
(1-12)</td><td>A set of twelve dummy variables indicating the current calendar month. 1=January, 12=December. Number 4 (April) is the reference.</td></tr>
<tr><td></td><td>Individual characteristics</td></tr>
<tr><td>pre_VR_state
(1-4)</td><td>A set of four dummies describing the pre-VR state.
<table>
<tr><th>Nr</th><th>Description</th></tr>
<tr><td>1</td><td>Persons with less than 12 months of previous sickness history prior to spell start. These are labeled short-term ill in the paper.</td></tr>
<tr><td>2</td><td>Persons with at least 12 months of previous sickness history prior to spell start. These are labeled long-term ill in the paper.</td></tr>
<tr><td>3</td><td>Persons with both sickness history and unemployment history prior to spell start. These are included with the long-term ill in the paper.</td></tr>
<tr><td>4</td><td>Persons without sickness benefits.</td></tr>
</table>
See section 2.1 for a more thorough explanation.</td></tr>
</table>

Table A4
The variables

<table>
<tr><th>Variable</th><th>Description</th></tr>
<tr><td>age_work-exp
(1-28)</td><td>A set of 28 dummies, describing previous work experience conditioned on age at spell start. The interval of working years in each cell is based on the 25’th, 50’th and 75’th percentiles. In addition each age group has a separate effect for non-working years and one year only. The table below reports all 28 groups.
<table>
<tr><th>Age</th><th colspan="4">The interval of working years in each group</th><th>Dummy number</th></tr>
<tr><td><20</td><td>0</td><td>>0</td><td></td><td></td><td>1-2</td></tr>
<tr><td>20-24</td><td>0</td><td>1</td><td>>1</td><td></td><td>3-5</td></tr>
<tr><td>25-29</td><td>0</td><td>1-4</td><td>>5</td><td></td><td>6-8</td></tr>
<tr><td>30-34</td><td>0</td><td>1-6</td><td>7-11</td><td>>11</td><td>9-12</td></tr>
<tr><td>35-39</td><td>0</td><td>1-5</td><td>6-11</td><td>>11</td><td>13-16</td></tr>
<tr><td>40-44</td><td>0</td><td>1-8</td><td>9-15</td><td>>15</td><td>17-20</td></tr>
<tr><td>45-49</td><td>0</td><td>1-11</td><td>12-17</td><td>>17</td><td>21-24</td></tr>
<tr><td>50 +</td><td>0</td><td>1-15</td><td>16-23</td><td>>24</td><td>25-28</td></tr>
</table>
The reference is dummy number 11 (30-34 years old and 7-11 years of work-experience). Persons belonging to group 6, 9, 10, 13, 14, 17, 18, 21, 22, 25 and 26 is defined as having little work experience in this paper.</td></tr>
<tr><td>education
(1-7)</td><td>A set of 17 dummies indicating highest previous level of completed education. The reference is number 5. The table below gives a complete description of the different education levels.
<table>
<tr><th></th><th>Type of previous education</th></tr>
<tr><td>1</td><td>Only compulsory education</td></tr>
<tr><td>2</td><td>High school, humanities subjects, one or two years</td></tr>
<tr><td>3</td><td>High school, humanities subjects, three years</td></tr>
<tr><td>4</td><td>High school, occupational subjects, one or two years</td></tr>
<tr><td>5</td><td>High school, occupational subjects, three years</td></tr>
<tr><td>6</td><td>One or two years of higher education</td></tr>
<tr><td>7</td><td>More than two years of higher education</td></tr>
</table></td></tr>
<tr><td>profession
(1-9)</td><td>A set of nine dummies indicating the last labor market profession. The reference is number 7. The table below gives a complete description of the different professions.
<table>
<tr><th></th><th>Type of previous profession</th></tr>
<tr><td>1</td><td>Academic</td></tr>
<tr><td>2</td><td>Public sector (general)</td></tr>
<tr><td>3</td><td>Health sector</td></tr>
<tr><td>4</td><td>Primary industries</td></tr>
<tr><td>5</td><td>General industries (secondary industries)</td></tr>
<tr><td>6</td><td>Construction- and building sector</td></tr>
<tr><td>7</td><td>Service related sector</td></tr>
<tr><td>8</td><td>Educational sector</td></tr>
<tr><td>9</td><td>Unknown</td></tr>
</table></td></tr>
<tr><td>ln_income</td><td>Income is defined as average labor market income in the working years accounted for in the age_work-exp variable above. Then $\ln\_\text{income} = \ln\left(income\right) - \ln(\overline{income})$. People without previous work experience (and thereby no previous labor market income) are set to zero.</td></tr>
</table>

Table A4
The variables

Variable	Description
ln_disability	This is natural logarithm of the expected public disability pension. It is constructed as deviation from the mean.
ln_spouse-income	This is natural logarithm of the current labor market income of the spouse. It is constructed as deviation from the mean.
spouse (0-3)	A set of four dummies describing the marital status 0: No spouse 1: Having a spouse in the labor market 2: Having a spouse outside the labor market 3: Having a spouse with disability pension Having no spouse is the reference.
children (1-32)	A set of 32 dummies describing the composition of children in the family. The children are divided into four different groups depending on age; 0-3, 4-6, 7-12, 13-16. Then we construct 16 dummies depending of the combination of these groups. All the combinations are illustrated in the table below. Number 1 is having zero kids. In number 2-5 all children are in the same age-group. From 6 to 16 there are at least two children in different age-groups.

	Age groups					Age groups			
	0-3	4-6	7-12	13-16		0-3	4-6	7-12	13-16
1					9		X	X	
2	X				10		X		X
3		X			11			X	X
4			X		12	X	X	X	
5				X	13	X		X	X
6	X	X			14	X	X		X
7	X		X		15		X	X	X
8	X			X	16	X	X	X	X

diagnosis (1-10)	A set of 11 dummies capturing the effect of medical diagnoses. Number 11 is the reference group.

Nr	Description	ICPC code
1	General diagnoses	All other codes
2	Skin diseases like dermatitis	A12,S02, S87, S88
3	Heart disease, infarction and stroke	K74, K75, K76, K77, K78, K90
4	Musculoskeletal (other)	L
5	Musculoskeletal (Neck, back)	L01, L09, L10, L11, L12, L92, L93
6	Musculoskeletal (shoulder, arm)	L08, L09, L10, L11, L12
7	Musculoskeletal (hip, leg)	L13, L14, L15, L16, L17, L89, L90
8	Psychological (other)	P
9	Psychological (nervous, stress, depressed)	P01, P02, P03, P74, P76
10	Psychological (alcohol/ drug abuse)	P15, P16, P17, P18, P19
11	No diagnoses	

Table A4
The variables

Variable	Description
immigrant (1-9)	1: Non-immigrant 2: Male immigrant, OECD, less than 10 years since arrival 3: Male immigrant, OECD, at least 10 years since arrival 4: Female immigrant, OECD, less than 10 years since arrival 5: Female immigrant, OECD, at least 10 years since arrival 6: Male immigrant, non-OECD, less than 10 years since arrival 7: Male immigrant, non-OECD, at least 10 years since arrival 8: Female immigrant, non-OECD, less than 10 years since arrival 9: Female immigrant, non-OECD, at least 10 years since arrival The reference group is number 1, non-immigrants.
region (1-4)	A set of four dummies representing the geographical areas of Norway. 1: The eastern part of Norway 2: Oslo and Akershus 3: The western and southern part of Norway 4: The northern part of Norway
	Heterogeneity distribution
mu (1-17)	The 17 mass points in the heterogeneity distribution (v)
prob (1-17)	The probabilities in the heterogeneity distribution (q)