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**Center for Public Policy  
& Administration**

# Utah State Office of Rehabilitation Economic Impact Study

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## Executive Summary

The focus of this research study was to determine the financial costs and benefits of the Utah State Office of Rehabilitation's Vocational Rehabilitation program. The mission of the Utah State Office of Rehabilitation (USOR) is to "assist eligible individuals with disabilities to prepare for and obtain employment and increase their independence." The Vocational Rehabilitation (VR) program provides services to individuals whose disability is a substantial impediment to employment. The study examined two primary questions:

1. What has been the impact of the Vocational Rehabilitation Program on participants' earnings and employment?
2. What are the public and private costs and benefits associated with the Vocational Rehabilitation Program?

The following summarizes analysis of data for a program group and a comparison group. The analysis measures the economic impact that the program has on individuals' incomes as well as the cost and benefits to the State of Utah.

### Earnings Impact

What is the net impact of participation in the Vocational Rehabilitation (VR) Program on earnings? To increase reliability, employer reports of employee's earnings to the Utah Unemployment Compensation Fund are used for analysis. This data is referred to as "UI-covered employment." The analysis of earnings impact included only those consistently employed before and after receipt of VR services.

The answer to this question is that the earnings impact appears to be positive, and quite large, based on the analysis of case closures from October 1, 2007 to September 30, 2008. This conclusion is based on the following results.

Using a simple comparison of earnings, the difference between those applicants who received services (program group) and those who did not (comparison group) was \$3,267 in the first year after services, \$2,484 in the second year, and \$2,723 in the third year after services (in 2011 dollars).

In order to ensure that the higher earnings of the program group is not based on an unobservable systemic difference in the program group versus the comparison group, a regression analysis was conducted to test for the difference in earnings between the two groups while controlling for individual and labor market characteristics.

Non-significantly-disabled applicants who receive services exhibit wages that are \$1,707 higher than applicants who do not receive services. The effect is reduced to \$825 and \$474 for clients who are significantly-disabled and most-significantly disabled, respectively. The earnings advantage diminishes over time. For a description of the three levels of disability see Appendix A.

## **Employment Impact**

What is the net impact of participation in the Vocational Rehabilitation Program on UI-covered employment in Utah? As noted above, these are employer reports of employee's earnings to the Utah Unemployment Compensation Fund. Analysis of impact on employment only included individuals that were not consistently employed before and after services.

Like earnings, the impact on employment is positive and quite large, based on the analysis of case closures from October 1, 2007 to September 30, 2008. This conclusion is based on the following results.

Using a simple comparison of means, those who receive services are 18% more likely to be employed than those who did not in the first quarter after closure. For the second quarter after closure, those who received services were 17% more likely to be employed.

In order to ensure that the higher employment rates for the program group are not based on an unobservable system difference in the program group versus the comparison group, regression analysis was used to test for the difference in earnings between the two groups while controlling for individual and labor market characteristics. On average, those who received services were 24% more likely to be employed, for the three years after case closure.

## **Costs and Benefits of Vocational Rehabilitation Program**

### **Private Benefits**

Economic benefits to the individual come in two forms:

- For those who are working before and after receiving services, an increase in earnings.
- For those who were not working consistently prior to receiving services, an increase in the likelihood of employment and, therefore, earnings.

The USOR Vocational Rehabilitation program helps increase earnings in Utah by over \$173 million; over \$40 million from increased earnings and over \$132 million from increased employment.

### **Public Benefits**

While the individuals who participate in the vocational rehabilitation program see large increases in their earnings, the State of Utah also benefits from the increased earnings because of an increase in tax revenue. Looking only at VR clients with their cases closed in FY 2008, we estimate the present value of the additional tax revenue to be in excess of \$16 million, over the working life of the service recipients. Public benefits also include decreased payments from SSI, SSDI, TANF, GA, Veteran's Disability, Worker's Compensation and other programs. Some of these programs are funded through the state and some are funded through the federal government. The reduction in these benefits will result in savings with a present value of over

\$25 million. The State of Utah also saves \$2.2 million (present value) in Medicaid benefits. In summary, for VR clients with their cases closed in FY2008, the total combined public benefits have a present value of \$43.9 million.

Public costs of the program are the amount that the state spends on administering the Vocational Rehabilitation program. The state spent \$11 million on the Vocational Rehabilitation program in FY2008. The federal government contributed \$28 million for a total of \$39 million.

The final result of the above calculations reveals that for every state dollar spent on Vocational Rehabilitation, \$3.89 dollars are returned to the state in terms of increased taxes and decreased benefits from public programs.

### **Limitations of the Study**

- While the study faced limitations, every attempt was made to be conservative in our estimates so that the impact of the Vocational Rehabilitation program is, if anything, underestimated. Limitations of the study include: Limited external validity
- Limitations of using non-experimental data (including self-selection bias)
- Service definitions
- Data limitations

# The Utah State Office of Rehabilitation Economic Impact Study

## Context of Evaluation

### Demographics of People with Disabilities

According to the 2008 American Community Survey (ACS), there were 240,034 persons with a disability in Utah (9% of the state’s population). This is significantly lower than the national percentage of 12%. The following two tables provide greater detail by age and sex of those in Utah and the United States with and without a disability.

Table 1 illustrates the number and percent of individuals with a disability in Utah and the United States. Utah has a similar percentage of men and women with disabilities, both 9%. Likewise the U.S. percentages are the same for both sexes, although higher than Utah’s at 12%.

<b>Table 1: Individuals with Disabilities for Utah and the United States by Sex and Age</b>				
	<b>Utah</b>		<b>United States</b>	
	Number	Percent	Number	Percent
<b>Male</b>	<b>118,687</b>	<b>9%</b>	<b>17,113,707</b>	<b>12%</b>
Male <18 years	15,196	3%	1,818,212	5%
Male 18-64	64,485	8%	9,475,281	10%
Male 65+ years	39,006	36%	5,820,214	36%
<b>Female</b>	<b>121,347</b>	<b>9%</b>	<b>18,958,095</b>	<b>12%</b>
Female <18 years	10,490	3%	1,078,725	3%
Female 18-64 years	62,212	8%	9,519,804	10%
Female 65+ years	48,645	37%	8,359,566	39%
<b>Total</b>	<b>240,034</b>	<b>9%</b>	<b>36,071,802</b>	<b>12%</b>
<i>Source: 2008 American Community Survey</i>				

Table 2 illustrates the percent by race or ethnicity that have disabilities for the United States and Utah. Utah has a smaller percentage of each race that has a disability compared to the United States. Table 2 represents the percent of the

population of a certain race with a disability, so while Utah has a less diverse population, this should not affect these percentages. For example, 5.24% of the black population in Utah has a disability compared to 13.81% of the US black population.

<b>Table 2: Individuals with a Disability in Utah and the United States by Race and Ethnicity</b>				
	<b>Utah</b>		<b>United States</b>	
	Number	Percent*	Number	Percent*
White	224,921	9.13%	27,813,550	12.39%
Black	1,470	5.24%	5,006,093	13.81%
American Indian or Alaska Native	3,666	13.04%	400,314	16.81%
Asian	2,057	3.85%	897,466	6.73%
Native Hawaiian and Other Pacific Islander	907	4.50%	40,063	9.62%
Other	3,460	6.15%	1,128,215	7.65%
Two or More Races	3,553	6.44%	786,101	11.43%
Hispanic or Latino	15,947	4.90%	3,883,628	8.41%
* Percent is the percent of the race with a disability.				
<i>Source: 2008 American Community Survey</i>				

### **Labor Market Experience for Individuals with Disabilities**

Many studies have shown the high prevalence of poverty among people with disabilities.<sup>1</sup> A new study reveals a high prevalence of disabilities among people in poverty. She and Livermore found that, using a one-year measure of poverty, 47% of those in poverty had a disability and, using a long-term measure of poverty, 65%

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<sup>1</sup>For an overview of previous research see Shawn Fremstad, "Half in Ten: Why Taking Disability into Account Is Essential to Reducing Income Poverty and Expanding Economic Inclusion," (Washington DC: Center for Economic and Policy Research, 2009).

of those in poverty had a disability.<sup>2</sup> Thus, not only are people with a disability likely to be poor, but also those that are long-term poor are likely to have a disability. The research by She and Livermore is groundbreaking in illustrating the major role that disabilities play in poverty.

Table 3 illustrates the substantial difference in employment rates for individuals with disabilities compared to individuals without disabilities. In Utah 46.33% of individuals with a disability are employed compared to 79.46% without a disability. Individuals with a disability are more likely to be employed in Utah (46.33%) compared to nationally (39.06%). This difference is statistically significant.

<b>Table 3: Percent Employed United States and Utah by Disability Status</b>			
	United States	Utah	<b>Statistically Significant Difference*</b>
With a Disability	39.06%	46.33%	YES
Without a Disability	77.69%	79.46%	YES

Source: U.S. Census Bureau, 2008 American Community Survey  
 \*Statistically significant difference between Utah and the United States at the 90 percent confidence level.

Table 4 is based upon the 2008 US Census. Both males and females in Utah without a disability have significantly lower median earnings than the national median. The median earnings for Utah males without a disability was \$35,275. The median earnings for Utah males with a disability was \$25,341, almost \$10,000 less. The median earnings for Utah females without a disability was \$19,332. The median earnings for Utah females with a disability was \$14,592, almost \$5,000 less.

The conclusion that we can draw from Tables 3 and 4 is that Utahns with a disability do relatively well in Utah, but still have much lower unemployment rates and earnings than individuals without a disability.

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<sup>2</sup>Peiyun She and Gina A. Livermore, "Long-Term Poverty and Disability among Working-Age Adults," *Journal of Disability Policy Studies* 19, no. 4 (2009).



<b>Table 4: Median Annual Earning by Sex and Employment Disability</b>			
	<b>United States</b>	<b>Utah</b>	<b>Statistically Significant Difference*</b>
Total:	\$29,960	\$26,190	YES
With a disability:	\$20,250	\$20,267	NO
Male:	\$24,119	\$25,341	NO
Female:	\$16,122	\$14,592	NO
Without a Disability	\$30,469	\$26,539	YES
Male:	\$36,154	\$35,275	YES
Female:	\$24,733	\$19,332	YES
Source: U.S. Census Bureau, 2008 American Community Survey			
*Statistically significant difference between Utah and the United States at the 90 percent confidence level.			

### Description of USOR

This section of the report outlines the mission and programs of the Utah State Office of Rehabilitation. In addition, it also details the services of the Vocational Rehabilitation program, which is the program studied in this report.

### Mission and Programs of USOR

The mission of the Utah State Office of Rehabilitation is to “assist eligible individuals with disabilities to prepare for and obtain employment and increase their independence.” There are several divisions within USOR that work to meet its mission; the focus here will be on the Division of Rehabilitation Services, and its Vocational Rehabilitation program. The Vocational Rehabilitation (VR) program provides services to individuals whose disability is a substantial impediment to employment. Services are available according to individual’s needs, abilities, and choices. Vocational Rehabilitation services are provided through the USOR’s Division of Rehabilitation Services and Division of Services for the Blind and Visually Impaired.

### Vocational Rehabilitation Program

The mission of the Vocational Rehabilitation program is to assist eligible individuals with disabilities to prepare for and obtain employment. The services provided include assessment, counseling and guidance, restoration, training, job development and job placement. These services are individualized and are provided to those

determined eligible due to having physical or mental impairments that result in a substantial impediment to employment.

## Design and Description of the Study

### Purpose

The purpose of the study was to determine the return on investment of public investments in the Utah State Office of Rehabilitation for the Vocational Rehabilitation Program. The goal of the study is to answer two research questions.

1. What has been the impact of the Vocational Rehabilitation Program on participants' earnings and employment?
2. What are the public and private costs and benefits associated with the Vocational Rehabilitation Program?

### Data

Two data sources were used for this study:

1. The primary data comes from the USOR dataset that is maintained as required by the federal Rehabilitation Services Administration (RSA). This dataset contains participant data including: background, services, and outcomes.
2. The second dataset was obtained from the Department of Workforce Services matching quarterly wage data for participants working in positions covered by Utah Unemployment Compensation Insurance Fund (or UI-covered employment) for the 12 quarters prior to application and the 12 quarters after closure.

The analytic sample includes individuals with closure dates from October 1, 2007 through September 30, 2008 (6,652 cases in fiscal year 2008). The initial sample of 6,652 was narrowed due to several factors. First, only individuals with a positive eligibility determination aged 18-62 were included.<sup>3</sup> Older workers were excluded because they may make different decisions about labor market participation, which would affect their labor market outcomes. Second, workers with an application date prior to December 1, 2003 were excluded because the Unemployment Insurance (UI) data was not available for 3 years prior to their application.<sup>4</sup> Third, only select closure types were included. Closure types indicate the reason that an individual's case was closed.

The possible closure types are:

1. Exited as an applicant;
2. Exited during or after a trial work experience/extended evaluation;

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<sup>3</sup> This resulted in 350 individuals being dropped from the sample.

<sup>4</sup> This resulted in 867 individuals being dropped from the sample.

3. Exited with an employment outcome;
4. Exited without an employment outcome after receiving services;
5. Exited without an employment outcome, after a signed IPE but before receiving services;
6. Exited from an order of selection waiting list – Not applicable to Utah because they are not using order of selection waiting lists; and
7. Exited without an employment outcome, after eligibility, but before an IPE was signed.

Four of the seven possible closure types were included in the study. Closure types 3, 4, 5 and 7 were included in the study because they include only participants who have been determined eligible (closure status 26, 28, and 30). Due to the narrowing of the sample for the above three reasons, the resulting sample included 5,435 individuals.

The study group was further divided into a comparison group and a program group. The program group consists of individuals who received services – closure types 3 and 4. The comparison group consists of individuals who were determined eligible but did not receive services – closure types 5 and 7.<sup>5</sup> The comparison group was created to show potential outcomes that would be achieved without services. This allows for a comparison of outcomes to be made for individuals with disabilities who received services from the Utah State Office of Rehabilitation with those who were eligible but did not receive services.

<b>Table 8: Number of Individuals in the Program, Comparison and Total Study Groups</b>		
Program	Comparison	Total
3,762	1,673	5,435

### **Outcome Measures**

The outcome measures for this study are:

1. Quarterly earnings from Unemployment Insurance covered employment in Utah.
2. Quarterly employment rates from Unemployment Insurance covered employment in Utah.

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<sup>5</sup> Some individuals with closure types 5 and 7 may have received minimal services related to the eligibility determination process. However, there is no clear method for determining which individuals received these services and as they were minimal, they should not materially alter the findings for employment outcomes.

A person is considered employed in a quarter when their earnings are greater than \$50.<sup>6</sup> Earnings were adjusted to 2011 dollars using the Consumer Price Index for All Urban Consumers (CPI-U). The sample includes quarters for all individuals, program and comparison, with wages greater than \$50.

### Model Specification and Predictors

Several predictors were used to explain the variation in earnings and employment. An observation is a person/quarter. The key predictors were:

- TIME: the numbers of quarters prior to eligibility or post closure. For example, TIME=-1 one quarter prior to application date and TIME=+1 for one quarter prior to case closure.
- EPOCH: a categorical variable indicating whether prior to eligibility or after closure.
- SERVICE: a categorical variable indicating whether or not the individual received services, for both program and comparison group participants.
- DISABILITY: a series of categorical variables indicating whether an individual's disability is non-significant, significant or most significant.
- LENGTH: time elapsed between eligibility and closure, the length of services received.
- REGIONAL UNEMPLOYMENT: the unemployment rate for Utah for the quarter.

The general form of the earnings regression model is:

$$\begin{aligned}
 Y_{ij} = & \beta_{0i} + \beta_1 \text{TIME}_{ij} + \beta_2 \text{TIME}_{ij}^2 + \beta_3 \text{SERVICE} * \text{TIME}_{ij} \\
 & + \beta_4 \text{SERVICE} * \text{TIME}_{ij}^2 + \beta_5 \text{SERVICE} * \text{EPOCH}_{ij} \\
 & + \beta_6 \text{EPOCH}_{ij} * \text{SERVICE}_{ij} * \text{TIME}_{ij} + \beta_7 \text{EPOCH}_{ij} * \text{SERVICE}_{ij} * \text{TIME}_{ij}^2 \\
 & + \beta_8 \text{DISABILITY}_{ij} * \text{EPOCH}_{ij} + \beta_9 \text{SERVICE} * \text{DISABILITY}_{ij} * \text{EPOCH}_{ij} \\
 & + \beta_{10} \text{REGIONAL UNEMPLOYMENT RATE}_{ij} \\
 & + \beta_{11} \text{LENGTH OF SERVICE}_i * \text{EPOCH}_i \\
 & + \beta_{12} \text{LENGTH OF SERVICE}_i * \text{EPOCH}_i * \text{SERVICE} + \varepsilon_{ij}
 \end{aligned}$$

In this model,  $Y_{ij}$  represents the quarterly earnings for individual  $i$  at time  $j$ , TIME represents the quarter for individual  $i$  at time  $j$  relative to the quarter of application

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<sup>6</sup>The Unemployment Insurance data does not cover all employees. No data for a participant in a quarter was interpreted as representing \$0 in that quarter (recognizing that UI data does not capture self-employment earnings, nor those for several other categories of employment, including for religious organizations and some agricultural enterprises). Thus the estimates of earning and employment may be lower than actual and, therefore, underestimate the impacts of the services provided by the State Office of Rehabilitation.

or closure (for example, -1 for the first quarter prior to application and +1 for the first quarter after closure). EPOCH allows us to distinguish between the period before application and the period following closure. SERVICES is the indicator of whether a consumer received services, DISABILITY reflects the significance of disability at eligibility determination, LENGTH indicates the total number of quarters between eligibility determination and closure, and REGIONALUNEMPLOYMENTRATE is the proxy for local labor market/economic conditions. The model further includes two-way interaction terms capturing the interaction between epoch and time, epoch and the quadratic of time, service and time, service and the quadratic of time, service and epoch, and total number of quarters between eligibility determination and closure and epoch. Three-way interaction terms in the model include interactions between services, epoch, and time, between services, epoch and time in its quadratic form, between services, epoch, and disability categories, and between services, epoch and total number of quarters between eligibility determination and closure.

The first three terms ( $B_0$ - $B_2$ ) of the equation represent the earnings trajectory prior to application for USOR services. The following two terms ( $B_3$ - $B_4$ ) represent the change in the earnings trajectory for those who received services. The next three terms ( $B_5$ - $B_7$ ) show the change in the earnings trajectory for those who have received services after their case is closed. It is these coefficients that will answer the question: "How do earnings change after an individual receives services?" The next two terms ( $B_8$ - $B_9$ ) represent the effect of services on individuals with different levels of significant disabilities.  $B_{10}$  represents the effect that a proxy for state economic conditions (unemployment rate) has on earnings.  $B_{11}$  and  $B_{12}$  measure whether the length of time an individual is receiving services affects their earnings.

When fitting this earnings model to the data, it is important to note that earnings for quarters where no UI wage record match was obtained were omitted from the regression. This will lead to a potential underestimation of earnings for those who received services. This means that the results of the estimation will be conservative.

Given the key questions of what effects do USOR services have on earnings and employment, two separate analyses were done to distinguish the effects on earnings and the effects on employment. The analysis of earnings is described above and included only those participants who were employed. The employment analysis was designed similarly to the earnings analysis except that the dependent variable was an indicator of whether or not the individual was employed for that person/quarter. More technically, a logistical estimation was performed because the dependent variable was dichotomous. The logistical model was slightly different set of variables. The model includes a control for education because the econometric tool allows inclusion of a variable with no variation by individual.

Clustered standard errors by individual were used to control for any variation in individual earnings or employment that were not included in the equations, such as

education, experience, occupation, industry, etc., called the unobserved individual affect.<sup>7</sup>

## **Descriptive Statistics**

Before fitting models to the data to answer the net impact questions, descriptive statistics were computed for the program and comparison group samples.

### **Gender, Race, Ethnicity, Education and Disabilities**

Table 9 below provides descriptive statistics of consumers included in the sample. Included are the figures for the whole sample, the program group and the comparison group. The final two columns report the difference between the program and the comparison group and whether that difference is statistically significant. Only in isolated instances is there a significant difference between the comparison group and the program group indicating that any differences between the two groups are not likely to be systemic. Education level is the exception (see Results of Statistical Analysis for further information on addressing the significant differences in education level).

Fifty-five percent of the sample was male and 45% was female.

The sample was limited to individuals between the ages of 14 and 62. Thirty percent were between the ages of 18 and 27; 27% were 28-37; 22% were 38-47; 18% were 48-57; and 3% were 57-62. The average age was 37. By limiting the sample to applicants under the age of 63 we assume that clients at social security eligibility age will not pursue USOR services.

Sixteen percent of the sample had no high school diploma; 39% had a high school diploma; 39% had education beyond a high school diploma but less than 6% had a bachelor's degree or higher.

Ninety-four percent of the sample was white, with 3% black; 4.4% Native American; less than 1% Asian; and less than 1% Pacific Islander. Almost 11% of the sample was Hispanic.

Sixty-nine percent had a significant disability and 30% had a most significant disability. Only 1% had a non-significant disability. The definitions of the disabilities are complicated; a complete description of the three categories is included in Appendix A. An oversimplified description is those with a most significant disability face limitations in at least two functional categories such as: mobility, communication, self care, self direction, interpersonal skills, work tolerance, or work skills and requires multiple USOR services. An individual with a significant disability faces limitations in at least one functional category and requires multiple USOR services.

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<sup>7</sup> Mitchell A. Petersen, "Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches," *Review of Financial Studies* 22, no. 1 (2009).

<b>Table 9: Background Characteristics of Consumers</b>						
Characteristics		Whole Sample	Program Group	Comparison Group	Difference	Sig
Sample Size		5,435	3,762	1,673		
Gender Percentages						
	Male	55.34%	54.97%	56.19%	1.22%	
	Female	44.66%	45.03%	43.81%	1.22%	
Age Percentages						
	18-27	30.27%	29.56%	31.86%	2.30%	*
	28-37	26.55%	26.13%	27.50%	1.37%	
	38-47	21.99%	22.49%	20.86%	1.63%	
	48-57	17.88%	18.26%	17.04%	1.22%	
	57-62	3.31%	3.56%	2.75%	.81%	
Education Percentages						
	No Formal Schooling	.22%	.13%	.42%	.29%	**
	Elementary Education (grades 1-8)	1.12%	.90%	1.61%	.71%	**
	Secondary Education, No High school Diploma	12.13%	9.91%	17.10%	7.19%	***
	Special Education Certificate of Completion	2.85%	3.54%	1.32%	2.22%	***
	High School Graduate or Equivalency Certificate	38.51%	34.42%	47.70%	13.28%	***
	Post-secondary Education, No Degree	25.39%	26.98%	21.82%	5.16%	***

Characteristics		Whole Sample	Program Group	Comparison Group	Difference	Sig
	Associate Degree or Vocational/Technical	14.00%	17.18%	6.87%	10.31%	***
	Bachelor's Degree	4.82%	5.74%	2.75%	3.01%	***
	Master's Degree or higher	.96%	1.20%	.42%	.78%	***
Race Percentages						
	White	93.74%	93.67%	93.90%	.23%	
	Black	3.02%	2.84%	3.41%	.57%	
	Indian	4.40%	4.33%	4.54%	.21%	
	Asian	.75%	.85%	.54%	.31%	
	Pacific Islander	.70%	.66%	.78%	.12%	
Ethnicity Percentage						
	Hispanic	10.54%	10.26%	11.18%	.92%	
Significant Disability Percentages						
	Non Significantly Disability	.88%	.96%	.72%	.24%	
	Significantly Disability	69.00%	69.83%	67.12%	2.71%	**
	Most Significantly Disability	30.12%	29.21%	32.16%	2.95%	**
*, **, *** indicates statistically significant difference the 10%, 5%, and 1% confidence level, respectively						

### Labor Market Experiences

Table 10 shows mean wages for all members of the program group and the comparison group at application and at closure. The average quarterly wages for both the program and comparison groups was not statistically different at \$1,406 and \$1,401, respectively. At closure, the average quarterly wages for the program and comparison groups were \$2,707 and \$1,744, respectively. The difference in the



means, \$963, is statistically significant. The mean earnings for the program groups increased by 92.5% (\$1301) while the comparison group increased by 24.5% (\$343).

<b>Table 10: Wages at Application and Closure for All Applicants (n = 5435)</b>				
	Program Group	Comparison Group	Difference	Sig?
Quarterly Wages Quarter Prior to Application	\$1,406	\$1,401	\$5	
Quarterly Wages 1 <sup>st</sup> Quarter Post Closure	\$2,707	\$1,744	\$963	***
*, **, *** indicates statistically significant difference between at application and at closure amounts at the 10%, 5% and 1% confidence levels respectively.				

Table 11 provides data on the difference between the program and the comparison groups' annual wages for the 3 years after cases were closed.

<b>Table 11: Annual Earnings After Closure</b>					
	Whole Sample	Program	Comparison	Difference	Sig?
Year1	\$8,918.63	\$9,924.34	\$6,657.15	\$3,267.19	***
Year2	\$7,499.91	\$8,264.39	\$5,780.85	\$2,483.55	***
Year3	\$7,149.67	\$7,987.71	\$5,265.20	\$2,722.52	***
*, **, *** indicates statistically significant difference between at application and at closure amounts at the 10%, 5% and 1% confidence levels respectively.					

When comparing public assistance benefits between the program and the comparison group, we find no difference in the amount received at application (Table 12). However, after closure, the program group received \$26.47 less in monthly public benefits than the comparison group. Public assistance benefits include cash payments made by federal, state and or local governments for any reason. Public assistance payments come from programs such as Veteran's Disability, Temporary Assistance to Needy Families (TANF), Social Security

Insurance (SSI), Social Security Disability Insurance (SSDI), General Assistance (GA), Worker’s Compensation, and others.<sup>8</sup>

<b>Table 12: Public Assistance (monthly)</b>					
	Whole Sample	Program	Comparison	Difference	Sig?
At Application <sup>9</sup>	\$199.58	\$200.50	\$197.51	\$2.99	
At Closure	\$168.09	\$160.43	\$186.89	\$26.47	***
*, **, *** indicates statistically significant difference between at application and at closure amounts at the 10%, 5% and 1% confidence levels respectively.					

Table 13 details the difference between the program and comparison groups’ employment rates. Here we see a difference in the groups before application and after closure. “Quarters Relative to USOR” signifies the numbers of quarters prior to application if negative or after closure if positive. The difference between the comparison group and the program group is more pronounced after closure.

<b>Table 13: Average Quarterly Employment Rates</b>					
Quarters Relative to USOR	Whole Sample	Program	Comparison	Difference	Sig?
-2	44.25%	44.50%	43.69%	0.81%	
-1	43.97%	44.76%	42.20%	2.56%	*
1	52.82%	58.43%	40.23%	18.20%	***
2	49.07%	54.20%	37.54%	16.66%	***
*, **, *** indicates statistically significant difference between at application and at closure amounts at the 10%, 5% and 1% confidence levels respectively.					

<sup>8</sup>Others include payments made by federal, state and local governments for retirement or survivor benefits to the individual as well as unemployment insurance benefits and other temporary payments.

<sup>9</sup> This result differs slightly from Table 10 because this sample includes observations that were missing information about public benefits at closure and thus couldn’t be compared to the benefits at application. Table 10 presents a comparison limited to only those individuals with both application and closure information on public assistance benefits.

## Results of the Statistical Analysis

### Earnings Impact

What is the net impact of participation in the Vocational Rehabilitation Program on earnings from Unemployment Insurance covered employment in Utah? Only individuals who were employed in 18 or more of the quarters being analyzed are included in the analysis of earnings.

The answer to this question is that the earnings impact appears to be positive, and quite large, based on the analysis of case closures from October 1, 2007 to September 30, 2008. However, in contrast to the results we observed in FY2005, this large effect appears to diminish over time. This conclusion is based on the following results.

Using a simple comparison of means, the difference between those applicants who received services and those who did not was \$3,267 in the first year after services, \$2,484 in the second year, and \$2,722 in the third year after services (in 2011 dollars). Table 11 tabulates a comparison of the mean differences.

In order to ensure that the higher earnings of the program group is not based on an unobservable systemic difference in the program group versus the comparison group, we used regression analysis to test for the difference in earnings between the two groups while controlling for individual and labor market characteristics, including education level, disability category, and regional unemployment rate.

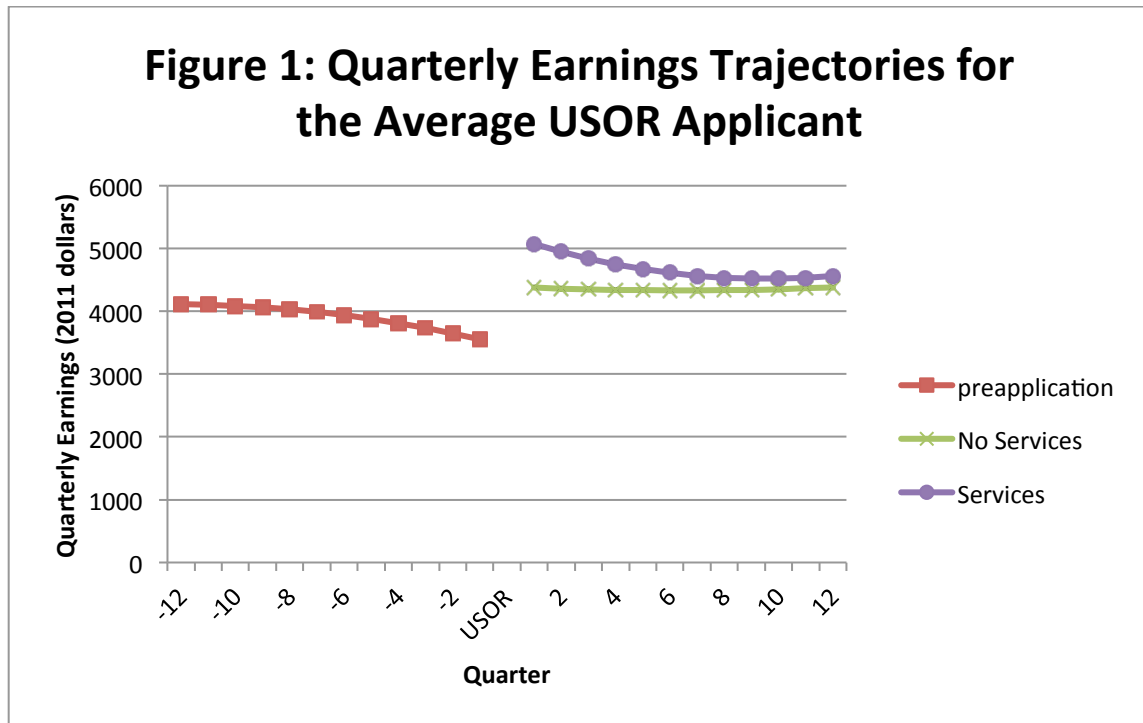
Non-significantly-disabled applicants who receive services exhibit wages that are \$1,707 higher than applicants who do not receive services. The effect is reduced to \$825 and \$474 for clients who are significantly disabled and most-significantly disabled, respectively. The earnings advantage diminishes over time. For a description of the three levels of disability see Appendix A. For a description of the three levels of disability see Appendix A.

Figure 1 shows the expected earnings trajectory for the average USOR applicant before they apply to USOR and after the case is closed with USOR.<sup>10</sup> The vertical axis illustrates quarterly earnings. The horizontal axis represents the period either quarters before application or quarters post closure. For example, -2 indicates 2 quarters before application, while 2 represents 2 quarters after closure. Exact

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<sup>10</sup> The distance between the two post closure lines in Figure 1 represents the change in earnings for the average participant. The data for Figure 1 is derived considering category of disability as well as all other control variables. This diminishes the post services gain and brings the average increase (the distance between the two lines) to \$325. Furthermore, the table employs average unemployment rates and disability categories to arrive at a more conservative estimate of the economic significance of services. The distance between the two post closure lines is not \$1,707 the difference for non-significantly-disabled applicants.

coefficients on each of the variables and their statistical significance can be found in Appendix B.



### Employment Impact

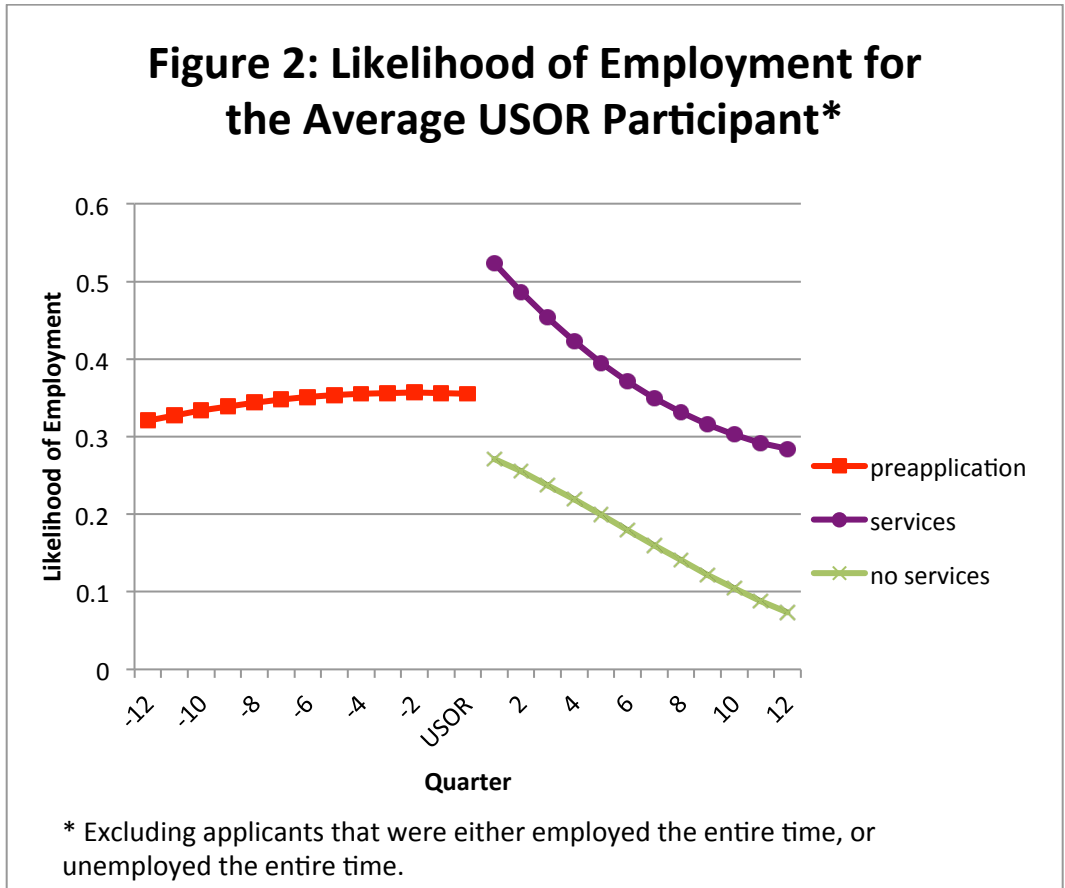
What is the net impact of participation in the Vocational Rehabilitation Program on UI-covered employment in Utah? To increase reliability, employer reports of employee’s earnings to the Utah Unemployment Compensation Fund are used for analysis. This data is referred to as “UI-covered employment.” Individuals who were employed less than 18 of the quarters being analyzed are included in the employment impact analysis.

Like earnings, the impact on employment is positive and quite large, based on the analysis of case closures from October 1, 2007 to September 30, 2008. This conclusion is based on the following results.

Using a simple comparison of means, those who receive services are 18.2% more likely to be employed in the first quarter after closure than those who did not. For the second quarter after closure, those who received services were 16.7% more likely to be employed (Table 13).

In order to ensure that the higher employment rates for the program group are not based on an unobservable systematic difference in the program group versus the comparison group, we used regression analysis to test for the difference in earnings between the two groups while controlling for individual and labor market characteristics. On average, those who received services were 24% more likely to be employed.<sup>11</sup>

Figure 2 shows the likelihood of employment for the average applicant prior to application and after application for both those that received services and those that did not. The initial difference of 26% diminishes to 22% by the 5<sup>th</sup> quarter after closure, but the gap returns to 26% by the 12<sup>th</sup> quarter, resulting in an average of 24%.



<sup>11</sup> This is only for those individuals whose employment status changed during the 12 quarters prior to application or the 12 quarters post closure. For those that were employed the entire time, changes are reflected in changes in their earnings. For those that were unemployed the entire time, there was no change due to services.

## **Costs and Benefits of the Vocational Rehabilitation Program**

Now that the impacts of the vocational rehabilitation have been isolated in the above statistical analysis, we can estimate the economic benefits to participants. This report will focus solely on economic benefits in the form of earnings and the earnings generated from employment. There are a myriad of benefits that accrue to an individual and a community from improving the productive abilities of individuals. These benefits will not be addressed here.

### **Private Benefits**

Economic benefits to the individual come in two forms:

- For those who are working consistently before and after receiving services, an increase in earnings.
- For those who worked less than 18 of the 24 quarters being analyzed, an increase in the likelihood of employment and, therefore, earnings.

The increase in earnings for an individual does not just occur in one year, but will continue for the duration of their working lives. Since the average age of USOR participants is 37, we will assume that individuals will continue to work for 28 years beyond their case closure. A discount rate of 3% was used to calculate the present value, which is an industry standard.<sup>12</sup>

The USOR Vocational Rehabilitation program helps increase earnings in Utah by over \$173 million (See table 14); over \$40 million from increased earnings and over \$132 million from increased employment. It is important to note that this is only for cases closed during one fiscal year – FY 2008.

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<sup>12</sup>Kevin M. Hollenbeck and Wei-Jang Huang, "Net Impact and Benefit-Cost Estimates of the Workforce Development System in Washington State," (Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, 2006).

<b>Table 14: Private Benefits</b>			
	Increase in Earnings	Increase in Earnings from Increase in Employment	TOTAL
Average Annual Increase per Person	\$1,302	\$5,373	
Present Value of Future Earnings for remainder of working life	\$15,143	\$101,538	
Number of People	2,696	1,066	3,762
Total Private Benefit	\$40,825,405	\$132,202,372	\$173,027,777
Note: "Total private benefit" is equal to present value of future earnings times the number of people. Any discrepancy is due to rounding.			

The \$173 million of additional earnings is the present value of the earnings increase that will be realized over a person's lifetime. Thus the \$173 million represents the current value in earnings of the cases closed in FFY 2008. Cases closed in 2009 (and subsequent years) will generate similar numbers in terms of present value of increased earnings.

Table 15 presents the distribution of the increased earnings by the county of residence of the Vocational Rehabilitation participants. This represents the increase in income in the respective county because of the services provided by Vocational Rehabilitation.

<b>Table 15: Increased Earnings by County of Residence</b>		
	Annual Benefits	Present Value Lifetime Benefits
Statewide	\$116,681	\$173,027,777 *
Beaver	\$408	\$605,597
Box Elder	\$3,594	\$5,329,256
Cache	\$6,896	\$10,225,942
Carbon	\$5,251	\$7,786,250

	Annual Benefits	Present Value Lifetime Benefits
Daggett	\$35	\$51,908
Davis	\$10,093	\$14,966,903
Duchesne	\$1,073	\$1,591,856
Emery	\$677	\$1,003,561
Garfield	\$35	\$51,908
Grand	\$770	\$1,141,983
Iron	\$2,217	\$3,287,528
Juab	\$537	\$795,928
Kane	\$70	\$103,817
Millard	\$910	\$1,349,617
Morgan	\$70	\$103,817
Piute	\$35	\$51,908
Salt Lake	\$40,733	\$60,403,997
San Juan	\$1,213	\$1,799,489
Sanpete	\$1,984	\$2,941,472
Sevier	\$1,879	\$2,785,747
Summit	\$432	\$640,203
Tooele	\$1,680	\$2,491,600
Uintah	\$1,213	\$1,799,489
Utah	\$12,508	\$18,548,578
Wasatch	\$677	\$1,003,561
Washington	\$3,734	\$5,536,889
Wayne	\$70	\$103,817
Weber	\$17,899	\$26,542,461
Note: "Present Value of Lifetime Benefits" for counties will not sum to statewide number due to rounding.		



## Public Benefits

While the individuals who participate in the vocational rehabilitation program see large increases in their earnings, the State of Utah also benefits from the increased earnings. First, the state collects additional tax revenue and second, the state pays less in public benefits to participants.

Public benefits include decreased payments from SSI, SSDI, TANF, GA, Veteran's Disability, Worker's Compensation and other programs. Some of these programs are funded through the state and some are funded through the federal government. Table 16 indicates the different public benefits and the amount on average that USOR services reduce payments for that benefit. The reduction in these benefits will result in a savings of over \$26 million over the working lifetime of the participants (Table 17). It is important to reiterate that this is only for cases closed during the fiscal year 2008.

In terms of increased taxes, Utahns with similar incomes to the participants paid 9.3% of their income in state and local taxes in 2007.<sup>13</sup> Thus, the \$173 million will result in the present value of \$16 million in increased state tax revenue (Table 17).

Program	Benefit reduction due to Vocational Rehabilitation Services per Month	Level of Government That Funds the Program
SSI	\$10.44	Federal
SSDI	\$0.00	Federal
TANF	\$6.24	State <sup>14</sup>
Other public assistance amounts including GA	\$23.03	State
Total	\$39.71	

Additional benefits accrue to the state in reduced participation in Medicaid. Those who participated in the program were less likely to be enrolled in Medicaid, saving the \$5,475 per year per person enrolled.<sup>15</sup> Because of the structure of funding, the

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<sup>13</sup>Institute on Taxation and Economic Policy, "Who Pays? A Distributional Analysis of the Tax Systems in All 50 States," 2009, [http://www.itepnet.org/wp2009/ut\\_whopays\\_factsheet.pdf](http://www.itepnet.org/wp2009/ut_whopays_factsheet.pdf).

<sup>14</sup> TANF is federally funded through a block grant system and administered by the state. Savings in benefit payments accrue to the state and can be used by the state for other approved TANF activities.

<sup>15</sup>Urban Institute and Kaiser Commission on Medicaid and the Uninsured estimates based on data from Centers for Medicare and Medicaid Services-64 reports, July 2007, <http://www.statehealthfacts.org/profileglance.jsp?rgn=46>. This report used

State of Utah paid approximately 28% of the \$5475 or \$1533. Twenty-two percent of those in the comparison group were enrolled in Medicaid versus 20% in the program group.

The State of Utah saves \$2 million (present value) in Medicaid benefits. This is in addition to the \$16 million in additional tax revenue and \$26 million in assistance payments (Table 17).

<b>Table 17: Summary of Present Value of Public Benefits</b>	
Increase in Tax Revenue	\$16,091,595
Decrease in Public Assistance Payments	\$25,572,522
Decrease in Medicaid Payments	\$2,213,252
<b>Total</b>	<b>\$43,877,369</b>

Public costs of the program are the amount that the state spends on administering the Vocational Rehabilitation program. The state spent \$11 million on the Vocational Rehabilitation program in Federal Fiscal Year (FFY) 2008. The federal government contributed \$28 million for a total of \$39 million (Table 18).

<b>Table 18: Public Costs of the Vocational Rehabilitation Program in FFY 2008</b>	
State Dollars	\$11,288,214
Federal Dollars	\$28,030,439
<b>Total</b>	<b>\$39,318,653</b>
Source: Utah Governor’s Office of Planning and Budget and Department of Education, Office of Special Education and Rehabilitative Services	

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the average spending per person as opposed to the much higher spending per persons with disabilities, which was 2.5 times larger in order to be conservative with estimates. In addition, the eligibility requirements to receive Medicaid because of a disability are different than the requirements to participate in Vocational Rehabilitation services.

The final result of the above calculations reveals that for every state dollar spent on Vocational Rehabilitation, \$3.89 dollars are returned to the state in terms of increased taxes and decreased benefits from public programs (Table 19).

<b>Table 19: Cost Benefit Analysis For the State of Utah</b>	
Public Benefits	\$43,877,369
Public Costs	\$11,288,214
Difference	\$32,589,155
Ratio	3.89

## **Limitations of the Study**

The study has several limitations that are discussed in the following sections.

### **Limited External Validity**

Since the analytic sample is not a random sample of individuals with disabilities in Utah, the external validity is limited. In other words, we cannot generalize our findings to the population of people with disabilities. However, similar results can be expected from eligible applicants to the Vocational Rehabilitation Program.

### **Limitations of Using Non-experimental Data**

Due to selection bias we cannot determine if the Vocational Rehabilitation services caused the differences that were observed. To completely eliminate selection bias we would need to create an experiment where individuals were randomly assigned to receive services or not. However, we have used statistical techniques to minimize the effects of selection bias in our results. Namely, we used an analytic approach that allowed us to control for differences between the program group and the comparison group.

### **Service Definitions**

Services were defined as a dichotomy in the analysis: either an individual received services or they did not. In reality, the quantity, intensity and duration of services varies greatly among those who receive services. Thus, it is possible that differences in services resulted in differences in outcome measures that were not captured. It should also be restated that some individuals that were included in the comparison group might have received a minimal level of services.

### **Data Limitations**

In this study, we encountered several data limitations. We lacked data on several individual characteristics such as time of onset of disability and employer characteristics that would have allowed us to more appropriately explain some of

the variation in earnings. The Unemployment Insurance (UI) covered employment data does not cover all employees. No earnings data for a participant in a quarter was interpreted as representing \$0 in that quarter. This might not be the case since UI data does not capture self-employment earnings, nor those for several other categories of employment, including for religious organizations and some agricultural enterprises.

## **Conclusion**

Utah's population is less likely to have a disability than the nation's population. Nevertheless, poverty is a substantial problem for the percent of the population that is disabled. Conversely, disabilities play a major role in the level of poverty. Individuals with disabilities are less likely to be employed and earn substantially less than individuals without disabilities.

The Vocational Rehabilitation Program run by the Utah State Office of Rehabilitation assists individuals with disabilities to improve their employment outcomes. This report measures the economic impact that the program has on individuals' incomes and the cost and benefits to the State of Utah. Measuring the family, personal and community benefits of increasing employment and earnings for individuals with disabilities are beyond the scope of this project.

## **Earnings Impact**

The earnings impact of USOR services appears to be positive, and quite large, based on the analysis of case closures from October 1, 2007 to September 30, 2008. However, in contrast to the results we observed in FY2005, this large effect appears to diminish over time. This conclusion is based on the following results.

Using a simple comparison of means, the difference between those applicants who received services and those who did not was \$3,267 in the first year after services, \$2,484 in the second year, and \$2,722 in the third year after services (in 2011 dollars). Individuals that had earnings 18 or more of the 24 quarters being analyzed were included in this analysis.

Non-significantly-disabled applicants who receive services exhibit wages that are \$1,707 higher than applicants who do not receive services. The effect is reduced to \$825 and \$474 for clients who are significantly-disabled and most-significantly disabled, respectively. The earnings advantage diminishes over time. For a description of the three levels of disability see Appendix A.

## **Employment Impact**

Like earnings, the impact of USOR services on the likelihood of employment is positive and quite large, based on the analysis of case closures from October 1, 2007 to September 30, 2008. This conclusion is based on the following results.

Using a simple comparison of means, those who receive services are 18% more likely to be employed than those who did not in the first quarter after closure. For

the second quarter after closure, those who received services were 17% more likely to be employed. Furthermore, after controlling for unobservable systematic differences in the program group versus the comparison group it is estimated that those who received services were 24% more likely to be employed in the 12 quarters post closure. This analysis included individuals that were employed less than 18 of the 24 quarters analyzed.

## **Costs and Benefits of Vocational Rehabilitation Program**

### **Private Benefits**

Economic benefits to the individual come in two forms:

- For those who are working before and after services, an increase in earnings.
- For those who were not working, an increase in the likelihood of employment and, therefore, earnings.

The USOR Vocational Rehabilitation program helps increase earnings in Utah by over \$173 million; over \$40 million from increased earnings and over \$132 million from increased employment.

### **Public Benefits**

While the individuals who participate in the vocational rehabilitation program see large increases in their earnings, the State of Utah also benefits from the increased earnings because of an increase in tax revenue. We estimate the present value of the additional tax revenue to be in excess of \$16 million. Public benefits also include decreased payments from SSI, SSDI, TANF, GA, Veteran's Disability, Worker's Compensation and other programs. Some of these programs are funded through the state and some are funded through the federal government. The reduction in these benefits will result in savings with a present value of over \$25 million for the participants in FY2008. The State of Utah also saves \$2.2 million (present value) in Medicaid benefits. The total combined public benefits have a present value of \$43.9 million.

Public costs of the program are the amount that the state spends on administering the Vocational Rehabilitation program. The state spent \$11 million on the Vocational Rehabilitation program in FY2008. The federal government contributed \$28 million for a total of \$39 million.

The final result of the above calculations reveals that for every state dollar spent on Vocational Rehabilitation, \$3.89 dollars are returned to the state in terms of increased taxes and decreased benefits from public programs.

While the study faced limitations, every attempt was made to be conservative in our estimates so that the impact of the Vocational Rehabilitation program is, if anything, underestimated.

## Appendix A

From USOR Case Service Manual Chapter 24

<http://www.usor.utah.gov:81/csm/CHAPT24.htm>

### 24.3 Definitions

#### A. Individuals with the Most Significant Disabilities

1. An individual with the most significant disabilities means a person who exhibits serious limitations as a result of the disability(ies), in two or more functional categories such as: mobility, communication, self care, self direction, interpersonal skills, work tolerance, or work skills **and** the individual will require multiple VR services over an extended period of time.

**Examples of serious limitations under functional categories include but are not limited to:**

- a. Mobility
  - i. Requires assistive devices (cane, canes for the blind, crutches, prosthesis, walker, wheelchair) to be mobile.
  - ii. Is unable to climb one flight of stairs without pause.
  - iii. Is unable to walk 100 meters without pause.
  - iv. Cannot evacuate from a building in less than three minutes without assistance.
  - v. Is unable to travel to and from worksite (including accessing public transportation) without assistance.
  - vi. Other similar mobility deficits.
- b. Communication
  - i. Expressive and receptive primary mode of communication is unintelligible to non-family members.
  - ii. Does not demonstrate understanding of simple requests or is unable to understand one-to-two step instructions including instructions given through an interpreter.
  - iii. Is unable to read or understand any written material or instructions due to disabling condition.
  - iv. Other similar communication deficits.

- c. Self-care  
Is unable to perform activities of daily living without assistance (i.e., loss of manual dexterity or coordination sufficient that he/she cannot perform personal hygiene tasks, dress self, prepare own meals etc. without assistance)
- d. Self direction
  - i. Is unable to provide informed consent for life issues without the assistance of a court appointed legal representative or guardian; or has been declared legally incompetent.
  - ii. Is unable to understand rights or responsibilities in judicial or other proceedings even with utilization of an interpreter.
  - iii. Is unable to perform work in an integrated setting without support because he/she is unable to tell time, manage time, and/or stay on task without assistance.
  - iv. Is unable to perform work outside sheltered environment.
  - v. Other similar deficits in self-direction.
- e. Interpersonal Skills
  - i. Has disfigurement or deformity so pronounced as to cause social rejection.
  - ii. Has demonstrated behavior such that the individual is a danger to self and others without supervision.
  - iii. Is unable to respond appropriately to supervision or to respond appropriately to co-workers or the public.
  - iv. Consistently demonstrates behavior toward others which is considered offensive, unpredictable or explosive.
  - v. Other similar interpersonal skill deficits.
- f. Work Tolerance  
Is unable to perform sustained work for more than 4 hours per day.

- g. Work Skills
  - i. Is unable to perform work tasks outside sheltered environment.
  - ii. Is unable to perform several types of work tasks (regardless of training) due to disabling condition.
  - iii. Other similar work skill deficits.

The counselor must document the functional deficits.

## 2. Determinations Made by Other Agencies.

While Federal Regulations prohibit assigning Order of Selection categories by disability type or automatically assigning categories, determinations made by other agencies may be utilized to assist the counselor in documenting the priority category as they give counselor information about functional limitations. For example, the Utah State Office of Rehabilitation (USOR) may receive documentation that the individual is:

- a. Eligible for services from the Division of Services for People with Disabilities; or (see Appendix 24 A)
- b. Determined Seriously and Persistently Mentally Ill (SPMI) by the Mental Health System, a duly licensed physician, licensed psychologist, other qualified provider under the Mental Health Professional Practice Act, the Judicial System in accordance with DSM-IV-TR; or (see Appendix 24 B)
- c. Found to be permanently and totally disabled by the State Labor Commission; (see Appendix 24 C).

In such cases the counselor can be assured that the individual has demonstrated limitations in some functional areas as listed in the appropriate appendices above. Regardless of the client's eligibility for other programs, however, the counselor must still document the specific functional deficits.

**NOTE: Individuals who are allowed SSI/SSDI disability benefits from the Social Security Administration MAY or MAY NOT be considered Most Significantly Disabled. To be considered Most Significant there must be two or more functional limitations or a determination from another agency as described under 24.3(A)(2)(a-c)**



B. Individuals With Significant Disabilities

A significantly disabled person is one who can be classified in any one of the following three categories at any time while he or she is in the vocational rehabilitation process:

**Category 1.** An individual who:

- a. has a significant physical or mental impairment which seriously limits one or more functional capacities (such as mobility, communication, self care, self direction, interpersonal skills, work tolerance, or work skills) in terms of an employment outcome (for examples of such on functional limitations see CSM 24.3 A 2); **and**
- b. whose vocational rehabilitation is expected to require multiple services over an extended period of time; **and**
- c. who has one or more physical or mental disabilities resulting from amputation, arthritis, autism, blindness, burn injury, cancer, cerebral palsy, cystic fibrosis, deafness, head injury, heart disease, hemiplegia, hemophilia, respiratory or pulmonary dysfunction, mental retardation, mental illness, multiple sclerosis, muscular dystrophy, musculoskeletal disorders, neurological disorders (including stroke and epilepsy), paraplegia, quadriplegia, and other spinal cord conditions, sickle cell anemia, specific learning disability, end-stage renal disease, or another disability or combination of disabilities determined to cause comparable substantial functional limitation.

**Category 2.** A recipient of a Social Security Disability Insurance benefits (SSDI) who requires multiple vocational rehabilitation services over an extended period of time.

**Category 3.** A recipient of a Supplemental Security Income (SSI) payment by reason of blindness or disability who requires multiple vocational rehabilitation services over an extended period of time.

**NOTE: Individuals who are allowed SSI/SSDI disability benefits from the Social Security Administration are considered to be at least Significantly Disabled.**

- C. Individual With a Disability [non-significantly disabled]  
An individual with a disability means an individual who:
1. has a physical or mental impairment which, for that individual, constitutes or results in a substantial impediment to employment;
  2. can benefit in terms of an employment outcome after receiving vocational rehabilitation services; and
  3. requires vocational rehabilitation services to prepare for, enter, engage in or retain gainful employment.
- D. Multiple Services  
Multiple VR services means - three or more services as listed under Section 103 of the Act.
- E. Extended Period of Time  
Extended Period of time means - the life span of the case is projected to be six months or more.

## Appendix B

### Earnings Regression Results

	Variable	Coef.	P> t	
<b>Pre eligibility</b>	TIME	(20.15)	0.001	***
	TIME2	1.59	0.002	***
<b>Services and their interactions with eligibility and time</b>	SERVTIME	(124.59)	0.000	***
	SERVTIME2	(8.48)	0.000	***
	SERVEPOCH	1,707.47	0.000	***
	SERVEPOCHTIME	44.66	0.220	
	SERVEPOCHTIME2	14.51	0.000	***
<b>Significance of Disability and its interaction with Epoch</b>	DIS2EPOCH	367.41	0.004	***
	DIS3EPOCH	(159.08)	0.280	
<b>Service and its interactions with significance of disability and epoch</b>	SERVDIS2EPOCH	(882.44)	0.001	***
	SERVDIS3EPOCH	(959.86)	0.001	***
	LENGTHEPOCH	109.19	0.000	***
	LENSERVEPOCH	(15.05)	0.468	
<b>Other</b>	UNEMPLOYRATE	(20.55)	0.054	*
	INTERCEPT	3,569.74	0.000	***

\*, \*\*, \*\*\* indicates statistically significant difference the 10%, 5%, and 1% confidence level respectively

## Employment Regression Results

	Variable	Coef.	P> z	
<b>Pre Eligibility</b>	TIME	(0.07)	0.000	***
	TIME2	(0.01)	0.000	***
<b>Post Eligibility</b>	EPOCH	0.10	0.771	
	EPOCHTIME	0.01	0.703	
	EPOCHTIME2	0.01	0.047	**
<b>Services and their interactions with eligibility and time</b>	SERVTIME	0.08	0.000	***
	SERVTIME2	0.01	0.000	***
	SERVEPOCH	1.03	0.005	***
	SERVEPOCHTIME	(0.18)	0.000	***
	SERVEPOCHTIME2	(0.00)	0.806	
<b>Significance of Disability and its interaction with Epoch</b>	DIS2EPOCH	0.23	0.482	
	DIS3EPOCH	(0.13)	0.687	
<b>Service and its interactions with significance of disability and epoch</b>	SERVDIS2EPOCH	(0.21)	0.567	
	SERVDIS3EPOCH	0.24	0.512	
	LENGTHEPOCH	(0.05)	0.000	***
	LENSERVEPOCH	0.02	0.055	*
<b>OTHER</b>	EDUCATION	0.11	0.000	***
	UNEMPLOYRATE	0.07	0.073	*
	UNEMPLOYRATE2	(0.01)	0.009	***
	INTERCEPT	(0.69)	0.000	***

\*, \*\*, \*\*\* indicates statistically significant difference the 10%, 5%, and 1% confidence level respectively

Data for Figure 1

<b>QUARTER</b>	<b>PREAPPLICATION</b>	<b>NO SERVICES</b>	<b>SERVICES</b>
-12	4,113.08		
-11	4,105.16		
-10	4,088.68		
-9	4,063.64		
-8	4,030.03		
-7	3,987.87		
-6	3,937.13		
-5	3,877.84		
-4	3,809.98		
-3	3,733.56		
-2	3,648.58		
-1	3,555.03		
<b>SERVICE PERIOD</b>			
<b>1</b>		4,378.03	5,068.08
<b>2</b>		4,362.63	4,946.19
<b>3</b>		4,350.42	4,839.54
<b>4</b>		4,341.37	4,748.12
<b>5</b>		4,335.50	4,671.94
<b>6</b>		4,332.80	4,610.99
<b>7</b>		4,333.27	4,565.27
<b>8</b>		4,336.92	4,534.80
<b>9</b>		4,343.73	4,519.55
<b>10</b>		4,353.73	4,519.54
<b>11</b>		4,366.89	4,534.77
<b>12</b>		4,383.23	4,565.23

Data for Figure 2

<b>QUARTER</b>	<b>PREAPPLICATION</b>	<b>NO SERVICES</b>	<b>SERVICES</b>
-12	0.4155		
-11	0.4230		
-10	0.4298		
-9	0.4358		
-8	0.4409		
-7	0.4453		
-6	0.4489		
-5	0.4516		
-4	0.4536		
-3	0.4547		
-2	0.4550		
-1	0.4544		
<b>SERVICE PERIOD</b>			
1		0.3593	0.6230
2		0.3404	0.5883
3		0.3195	0.5553
4		0.2969	0.5244
5		0.2730	0.4960
6		0.2481	0.4703
7		0.2228	0.4473
8		0.1976	0.4272
9		0.1729	0.4098
10		0.1493	0.3952
11		0.1271	0.3832
12		0.1067	0.3739