

# Supported Employment's Cost-Efficiency to Taxpayers: 2002 to 2007

Robert Evert Cimera  
Kent State University

*This study explored the cost-efficiency of all 231,204 supported employees funded by vocational rehabilitation throughout the entire United States from 2002 to 2007. Results found that supported employees returned an average monthly net benefit to taxpayers of \$251.34 (i.e., an annual net benefit of \$3,016.08 per supported employee) and generated a benefit–cost ratio of 1.46. Further, economic returns of supported employees were investigated across nine disabling conditions. Even individuals with the least cost-efficient disability (i.e., traumatic brain injuries) returned to taxpayers a monthly net benefit of \$111.62. Finally, this study determined that supported employees with multiple conditions were as cost-efficient as individuals with only one disability (i.e., benefit–cost ratios of 1.49 versus 1.46, respectively).*

**DESCRIPTORS:** supported employment, costs, taxpayer, cost-efficiency

Cost-efficiency, also known as cost–benefit analysis, compares the monetary benefits and costs that are accrued by a given perspective from the undertaking of a specific decision, such as whether to fund employment programs for people with severe disabilities (Levin & McEwan, 2000). Results from cost-efficiency analyses are typically reported in the form of benefit–cost ratios, where gross benefits are divided by gross costs. Ratios exceeding 1.00 indicate that a decision is cost-efficient; that is, its monetary benefits are greater than its corresponding monetary costs.

However, several authors have identified limitations of using benefit–cost ratios and instead suggest the use of net benefits (i.e., gross benefits minus gross costs) as a method of reporting results from cost-efficiency analyses (Boardman, Greenberg, Vining, & Weimer, 2006). Consider the following example. An employment program for individuals with disabilities generates \$2,000 of benefits to taxpayers for every \$1,000 of costs. Another employment program serving individuals with the same conditions generates \$4,000 of benefits to taxpayers for every \$2,000 of costs. Both programs have benefit–cost ratios of 2.00, indicating that for every dollar of costs, taxpayers actualize \$2.00 of benefits. Using only benefit–cost ratios,

these programs would appear to have identical returns on investment for taxpayers. However, the second program has a net benefit of \$2,000 (\$4,000 of benefits minus \$2,000 of costs) compared with \$1,000 (\$2,000 of benefits minus \$1,000 of costs) for the first program. In other words, all other outcomes being equal, the second employment program is more fiscally desirable to taxpayers.

Such analyses are pervasive throughout the supported employment literature. Since 1980, many authors have explored the monetary benefits and costs of supported employment from the worker's perspective (cf. Kregel, Wehman, & Banks, 1989; Lam, 1986; Thompson, Powers, & Houchard, 1992) or the taxpayers' (cf. Cimera, 2007a, 2007b; Cimera, 2008; McCaughrin, 1988) or both (cf. Baer, Simmons, Flexer, & Smith, 1995; Conley, Rusch, McCaughrin, & Tines, 1989; Hill, Banks, et al., 1987; Hill & Wehman, 1983; Lewis, Johnson, Bruininks, Kallsen, & Guillery, 1992; Rogers, Sciarappa, MacDonald-Wilson, & Danley, 1995; Zivolich, Shueman, & Weiner, 1997). For instance, Hill et al. (1987) examined the economic outcomes of 214 supported employees with intellectual disabilities in Virginia over a 94-month period. They found that these workers generated an average annual net return to taxpayers of \$7,111 and a benefit–cost ratio of 1.87, indicating that for every dollar of costs they experienced, taxpayers received \$1.87 in benefits. Conley et al. (1989), on the other hand, examined the monetary benefits and costs of 394 supported employees with a variety of disabilities in Illinois over a 12-month period. These authors found that taxpayers received \$0.66 of benefits for each dollar of cost. Further, Lewis et al. (1992) analyzed data collected from 11 adult services agencies serving 856 workers with disabilities in Minnesota. They found that, when compared with sheltered workshops, supported employment was cost-efficient to taxpayers in 7 of 11 agencies. Moreover, the benefit–cost ratios of these seven agencies ranged from 1.30 to 4.00.

Although a once well-explored field of inquiry, the cost-efficiency literature on supported employment has at least three significant limitations that impair its utility. The first is that nearly all of the available studies are out of date. Indeed, most studies exploring the cost-efficiency of supported employment are more than a decade old. Given that even small changes in economic outcomes can produce substantial changes in cost-efficiency, it is likely that nearly all of the available literature provides little useful information for current policymakers, politicians,

Address all correspondence and reprint requests to Robert Cimera, PhD, Assistant Professor, Kent State University, Educational Foundations and Special Services, P.O. Box 5190, Kent, OH 44242-0001. E-mail: rcimera@kent.edu

and practitioners (Heal, McCaughrin, & Tines, 1989). For this reason, cost-benefit analyses using contemporary data are needed if policymakers are to make informed decisions regarding whether supported employment programs should be funded and at what fiscal levels.

Second, all of the cost-efficiency research presently available is based on localized data. In fact, a significant portion of the literature is based on data from only two states—Illinois (cf. Cimera, 1998; Conley et al., 1989; McCaughrin, Rusch, Conley, & Tines, 1991; Rusch, Conley, & McCaughrin, 1993; Tines, Rusch, McCaughrin, & Conley, 1990) and Virginia (cf. Hill & Wehman, 1983; Hill et al., 1987; Hill, Wehman, Kregel, Banks, & Metzler, 1987; Wehman, Hill, Wood, & Parent, 1987; Wehman, Hill, Hill, Brooke, Pendleton, & Britt, 1985; Wehman et al., 2003). Further, no cost-efficiency study on supported employment has included data from across the United States. Given that the monetary costs and benefits generated by supported employees varies considerably between and within states (Cimera, 2000; Cimera & Rusch, 1999; Lewis et al., 1992), results from Illinois or Virginia cannot be applied to Idaho or Vermont or any other locale. Because of this, studies composed of data from multiple states or regions are required if supported employment's national cost-efficiency is to be determined.

Finally, because economic outcomes, such as wages earned and subsidies received, vary considerably from supported employee to supported employee (Cimera, 2009; Kregel et al., 1989; Lam, 1986), large sample sizes are required in order for cost-efficiency research to be representative of the entire population being served by supported employment. Unfortunately, many of the cost-efficiency studies currently available in the literature have sample sizes of less than 500 participants (cf. Cho & Schuermann, 1980; Cimera, 1998; Hill & Wehman, 1983; Lam, 1986; McCaughrin, 1988; McCaughrin et al., 1993; Tines et al., 1990); consequently, their conclusions may not be indicative of supported employees as a whole.

The present research sought to extend the literature on supported employment's cost-efficiency to taxpayers by addressing these weaknesses. Specifically, it used contemporary data (i.e., from 2002 to 2007) from all 231,204 supported employees who were served by vocational rehabilitation (VR) throughout the entire United States and its territories. In addition to determining whether supported employment is cost-efficient from the taxpayers' perspective, this study also investigated the cost-efficiency of individuals in nine different disability groups, including (a) sensory impairments, (b) physical disabilities, (c) intellectual disabilities, (e) traumatic brain injuries (TBIs), (f) autism, (g) mental illnesses, (h) communication disorders, (i) other health impairments, and (j) other learning difficulties. In addition, this study investigated whether the presence of secondary disabling conditions impacts an individual's cost-efficiency. Implications for policy and future areas of research are also discussed.

## Methods

### Data Source

The data analyzed for this study originated from the Rehabilitation Services Administration's (RSA) 911 database. The 911 database contains information, such as the services received and their cumulative costs, on all individual who have applied for assistance from VR throughout the United States and its territories (e.g., Puerto Rico, Guam, Virgin Islands). Data are entered into the computerized database by vocational rehabilitation counselors employed by each state's VR agencies. They are then cross-checked by two computer programs that identify discrepancies and potential errors within each case record as well as confirm that each field of data is unique and not a duplicate (RSA, 2004).

### Participants

From 2002 to 2007, 3,782,314 people had their cases closed by VR. Approximately 6.1% of these individuals (231,204) had supported employment as a vocational goal on their individual plan for employment, including those funded by Title I and Title VI-B sources. These supported employees comprise the focus of the present research. Their demographic backgrounds are delineated in Table 1.

### Variables

#### Primary disability

Once an applicant for VR services has been evaluated for eligibility, VR counselors classify the individual's primary disability as being one of 19 impairment codes (e.g., mental impairments, sensory impairments, physical impairments). Each impairment code is then assigned one of 37 "cause codes," including cause unknown, autism, mental retardation, schizophrenia, TBI, and so forth. For the purposes of the present research, the various combinations resulting from the 19 impairment and 37 cause codes were collapsed into nine disability categories. These included (a) *sensory impairments* (e.g., blindness, hearing impairments, deaf-blind), (b) *physical and mobility impairments* (e.g., cerebral palsy, amputations, spinal cord injuries), (c) *intellectual disabilities* (i.e., mental retardation), (d) TBIs, (e) *autism*, (f) *mental illnesses* (e.g., schizophrenia, depression, anxiety disorders), (g) *communication disorders* not caused by sensory impairments or mental retardation (e.g., expressive and receptive disorders), (h) *other health impairments* not included in any other categories (e.g., cancer, asthma, blood disorders), and (i) *other learning difficulties* not included in any other categories (e.g., specific learning disabilities, ADHD).

#### Secondary conditions

When applicants for VR services had a second disabling condition, it was coded using the same process used to classify their primary disability. For the present research,

Table 1  
Demographics of Supported Employees Served by VR (2002 to 2007)

Year	2002	2003	2004	2005	2006	2007	Total
N	35,740	38,092	39,518	39,038	40,368	38,448	231,204
Male (%)	57.3	57.2	57.2	57.4	56.7	57.5	57.2
Female (%)	42.7	42.8	42.8	42.6	43.3	42.5	42.8
Ethnicity (%) <sup>a</sup>							
White	73.1	72.4	74.7	75.3	74.8	73.8	74.1
African American	20.2	20.8	21.6	22.2	22.6	23.7	21.9
American Indian	1.1	1.2	1.3	1.4	1.5	1.5	1.3
Asian	1.5	1.5	1.6	1.6	1.5	1.8	1.6
Pacific Islander	0.4	0.4	0.3	0.5	0.5	0.4	0.4
Hispanic	7.6	7.5	8.2	7.8	7.6	7.8	7.8
Average age (years)	32.7	32.7	32.9	33.4	31.8	n/a	32.2
Primary disabling condition (%)							
Sensory	3.7	3.6	3.8	3.8	3.7	3.7	3.7
Physical/mobility	6.6	6.8	6.6	6.2	6.5	6.0	6.5
Intellectual	42.7	40.8	39.2	40.0	38.7	40.7	40.3
TBI	1.6	1.9	2.0	1.9	2.1	2.0	1.9
Autism	1.3	1.4	1.7	2.0	2.2	2.7	1.9
Mental Illness	31.0	30.0	29.3	29.0	29.0	29.4	29.6
Communication	0.3	0.4	0.6	0.6	0.7	0.7	0.6
Other health	4.2	3.9	3.8	3.6	3.8	3.4	3.8
Other learning	8.7	11.2	13.0	12.9	13.4	11.4	11.8
Had secondary condition	47.1	47.1	49.1	48.9	49.6	50.5	48.7
No secondary condition	52.9	52.9	50.9	51.1	50.4	49.5	51.3

<sup>a</sup>In 2002, 2003, 2004, 2005, and 2006, 44, 55, 7, 28, and 27 individuals, respectively, had missing ethnicity data. Further, individuals could identify themselves as having multiple ethnic backgrounds. Consequently, the cumulative percentage in the ethnicity columns may exceed 100%.

individuals were coded as either having or not having a secondary condition.

#### Change in subsidies received

At intake, VR counselors recorded how much each individual received in governmental subsidies per month. This variable was also recorded when the individual's case was closed. Types of governmental subsidies recorded included (a) Social Security Disability Insurance, (b) Supplemental Security Income, (c) Temporary Assistance for Needy Families, and (d) "All other Public Support," which included general assistance, veteran's disability benefits, and workers' compensation. To determine whether the amount of governmental subsidies received had changed as a result of supported employment, we subtracted the average monthly amount of subsidies received by supported employees at closure from the average monthly amount of public support received at application. For instance, if a supported employee received \$400 a month from various governmental programs (e.g., Social Security Disability Insurance, Supplemental Security Income, etc.) before entering supported employment and \$350 per month after entering supported employment, the change in subsidies would be \$50 per month. Because the amount of subsidies received in this example decreased after enrolling in supported employment, this would be considered a benefit to taxpayers (i.e., supported employment decreased the amount of subsidies received by \$50 per month). However, should the amount of subsidies received increase after enrolling in supported employment, this would be considered a cost to taxpayers.

#### Taxes paid

When cases were closed, VR counselors recorded the average amount of wages each supported employee earned per month. On the basis of these gross wages, taxes were calculated for Social Security, Medicare, federal income tax, and (when appropriate) state income taxes. When determining state and federal income taxes, it was assumed that individuals were single and declared nobody but themselves as dependents. Further, no deductions, other than standard deductions, were factored into these calculations. Taxes were computed using tax tables for 2007 provided online by each state's Department of Revenue or its territorial equivalent. Deductions for Social Security and Medicare were calculated at 6.2% and 1.45%, respectively (Tax Form Processing LLC, 2009).

#### Cost of supported employment services

RSA's 911 database documented the services provided to each supported employee (e.g., assessment, training, medical services, transportation) and the total outlay that VR paid vendors for furnishing them. The cumulative cost of services was divided by the number of months the individual received service, thus creating a monthly cost of supported employment.

#### Targeted Jobs Tax Credit

Employers who hire supported employees may be eligible for a Targeted Jobs Tax Credit (TJTC), which provides employers with a tax credit equal to 40% of the first \$6,000 earned by the supported employee (i.e., \$2,400). Authors of previous cost-efficiency research have

assumed that all employers would apply for and receive tax credits (cf. Hill, Wehman, et al., 1987; McCaughrin et al., 1991; Rusch et al., 1993). However, in a recent study, Cimera (2010) found that employers of supported employees investigated rarely used such incentives. For this study, it was assumed that 75% of employers would collect the tax credits offered through TJTC programs for an average monthly cost to taxpayers of \$150.

#### *Alternative program costs*

The costs of alternative programs (i.e., programs that individuals would have likely been in had they not entered supported employment) are considered a benefit to supported employment's taxpayer cost-efficiency (Conley & Noble, 1990; Johnston, 1987). For this study, it was assumed that individuals would have enrolled in sheltered workshops if supported employment had not been available. This assumption has been made throughout the supported employment cost-accounting literature (cf. Cimera, 1998; Rusch et al., 1993; Tines et al., 1990).

For this study, the average monthly cost of sheltered workshops was determined by using data presented by Cimera (2007a). By investigating the cumulative costs generated by 209 sheltered employees from 2002 to 2005, Cimera determined that the average per capita cost of the services that these individuals received was \$1,991 per fiscal quarter or \$663.67 per month in 2005 dollars. This figure is consistent with data presented by previous authors (cf. Hill et al., 1987; Wehman et al., 1985, 1987; Zivolich et al., 1997), if their data were converted to 2005 dollars using the conversion methods described in a subsequent section. For example, Wehman et al. (1987) determined that individuals in sheltered workshops generated \$8,428.06 of costs over a 21.1-month period (\$399.43 per month). If this figure is converted from 1987 dollars to 2005 dollars, it would equal \$686.70. Moreover, Zivolich et al. (1997) determined that the per capita monthly cost of sheltered workers was \$436 in 1990 dollars. Converted to 2005 dollars, this figure would be \$651.50.

#### *Calculating Cost-Efficiency*

Taxpayer cost-efficiency was determined using a formula used by numerous other authors (Baer et al., 1995; Cimera, 1998; Rusch et al., 1993; see Table 2). To calculate benefit-cost ratios, we divided gross monthly benefits by gross monthly costs. Net monthly benefit was calculated by subtracting gross monthly costs from gross monthly benefits.

#### *Conversion of Dollar Values*

Because the value of money changes over time, the monetary outcomes examined here had to be converted to identical fiscal denominations (i.e., 2008 dollars). This was accomplished by multiplying the dollar value by the consumers' price index (CPI) of the base year (2008) and then dividing the resulting product by the CPI of the year that the dollar value was originally designated (Levin &

Table 2

Cost-Efficiency Framework From the Taxpayers' Perspective	
Economic variable	Outcome
Taxes paid	Benefit
Change in subsidies <sup>a</sup>	Benefit
Savings from alternative program costs	Benefit
Supported employment operating expenditures	Cost
Tax credits to employers	Cost

<sup>a</sup> If the amount of subsidies received *increases* because of supported employment, change in subsidies would be a cost to taxpayers.

McEwan, 2000). For example, as previously stated, the average monthly cost of sheltered workers with intellectual disabilities identified by Cimera (2007a) was \$663.67 in 2005 dollars. To convert this figure to 2008 dollars, we multiplied \$663.67 by 2008's annual CPI (i.e., 215.303). The result was then divided by 2005's annual CPI (195.3), indicating that \$663.67 in 2005 is the equivalent to \$731.64 in 2008 dollars.

#### *Research Questions*

This study consisted of three primary research questions. The first explored supported employment's cost-efficiency to taxpayers from 2002 to 2007. The second sought to determine whether supported employees with certain disabilities (e.g., intellectual disabilities) were more cost-efficient than supported employees with other disabilities (e.g., mental illnesses). Finally, this study attempted to determine whether the presence of secondary conditions impacted an individual's cost-efficiency to taxpayers.

#### **Results**

##### *Question 1: Is Supported Employment Cost-Efficient From the Taxpayers' Perspective?*

As can be seen in the far right-hand column of Table 3, supported employees as an entire group generated an average monthly gross benefit to taxpayers of \$795.65. They also generated an average monthly gross cost of \$544.31, for a monthly net benefit of \$251.34 (i.e., annual net benefit of \$3,016.08), and a benefit-cost ratio of 1.46. In other words, for every dollar of costs garnered by taxpayers because of funding supported employment (e.g., supported employment's operating expenditures), taxpayers received an average of \$1.46 in benefits (e.g., savings from sheltered workshops).

##### *Question 2: Are Individuals With Certain Disabilities More Cost-Efficient Than Individuals With Other Disabilities?*

As also indicated in Table 3, taxpayer cost-efficiency varied considerably across all nine disability groups. Specifically, supported employees with "other learning disabilities" (i.e., the most cost-efficient of the groups examined) generated a monthly net benefit to taxpayers of \$446.30 (i.e., an annual per capita net benefit of \$5,355.66) and a benefit-cost ratio of 2.20. Conversely, supported employees with TBIs were the least cost-efficient

Table 3  
The Average Monthly Monetary Benefits and Costs to Taxpayers by Primary Disability of Supported Employee: 2002 to 2007

	Other learning difficulties	Other health impairments	Communication disorders	Mental illnesses	Physical disabilities	Autism	Sensory impairments	Intellectual disabilities	TBI	All supported employees
N	27,357	8,725	1,296	68,409	14,894	4,369	8,586	93,161	4,407	231,204
Change in subsidies	\$1.89	\$(11.08)	\$(33.73)	\$(0.15)	\$(14.77)	\$(31.13)	\$(26.83)	\$(8.06)	\$(21.55)	\$(6.83)
Savings from alternative programs	\$731.64	\$731.64	\$731.64	\$731.64	\$731.64	\$731.64	\$731.64	\$731.64	\$731.64	\$731.64
Taxes paid	\$83.75	\$79.14	\$68.73	\$76.19	\$79.00	\$60.22	\$88.43	\$57.63	\$77.40	\$70.84
Gross benefit	\$817.27	\$799.70	\$766.64	\$807.69	\$795.88	\$760.73	\$793.24	\$781.21	\$787.49	\$795.65
Cost of SE	\$220.98	\$265.33	\$284.21	\$331.76	\$329.62	\$320.64	\$437.79	\$501.47	\$525.87	\$394.31
TJTC	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00
Gross cost	\$370.98	\$415.33	\$434.21	\$481.76	\$479.62	\$470.64	\$587.79	\$651.47	\$675.87	\$544.31
Net benefit	\$446.30	\$384.37	\$332.43	\$325.92	\$316.26	\$290.10	\$205.45	\$129.74	\$111.62	\$251.34
Benefit-cost ratio	2.20	1.93	1.77	1.68	1.66	1.62	1.35	1.20	1.17	1.46

group examined. These individuals returned a monthly net benefit to taxpayers of \$111.62 and had a benefit-cost ratio of 1.17. However, despite these variations, all groups of supported employees were cost-efficient from the taxpayers' perspective.

### Question 3: Does the Presence of Secondary Conditions Impact Taxpayer Cost-Efficiency?

As indicated in Table 4, supported employees with and without secondary conditions actualized nearly identical degrees of cost-efficiency. Specifically, the 115,988 supported employees who did not have secondary diagnoses generated an average monthly net benefit to taxpayers of \$249.72 and an average benefit-cost ratio of 1.46. The 115,216 supported employees with secondary conditions generated an average monthly net benefit of \$263.46 and an average benefit-cost ratio of 1.49. Individuals with and without secondary conditions achieved similar outcomes across each of the nine disabilities investigated here.

## Discussion

Since even before it was officially defined by the Developmental Disabilities Assistance and Bill of Rights Act of 1984 (PL 98-527), supported employment's cost-efficiency had been extensively investigated (cf. Brickey & Campbell, 1981; Cho & Schuermann, 1980; Hill & Wehman, 1983; Schneider, Rusch, Henderson, & Geskeet, 1981). However, despite the early attention, this topic has been largely ignored of late. Indeed, most of the available literature on supported employment cost-efficiency to taxpayers is from the 1980s and 1990s and is now considerably out of date. Moreover, all available research was based on localized data gleaned from relatively small numbers of supported employees.

In addition to these methodological issues, the conclusions drawn from the available literature on supported employment's cost-efficiency have been highly fragmented. For instance, since 1980, several authors (Cimera, 1998; Hill et al., 1987; Hill & Wehman, 1983; Wehman et al., 1985, 2003) have found that supported employment generates more monetary benefits to taxpayers than monetary costs (i.e., cost-efficient), although others (Baer et al., 1995; Conley et al., 1989; Noble, Conley, Banerjee, & Goodman, 1991; Rogers et al., 1995; Rusch et al., 1993) have found that its costs to taxpayers exceed its corresponding benefits (i.e., cost-inefficient). Because this study examined the monetary costs and benefits generated by all supported employees served by VR throughout the entire United States and its territories from 2002 to 2007 (231,204 individuals), it is uniquely able to clarify the current economic merits of supported employment and answer the question of whether supported employment is cost-efficient from the taxpayers' perspective.

In doing so, this study found that the average supported employee served by VR generated a monthly net benefit to taxpayers of \$251.34 (i.e., annual per capita net benefit of \$3,016.08) and a benefit-cost ratio of 1.46.

Table 4  
Net Benefit and Benefit-Cost Ratios for Supported Employees With and Without Secondary Conditions

		Without secondary conditions	With secondary conditions
Sensory impairments	<i>N</i>	3,807	4,779
	Net benefit	\$239.02	\$178.70
	Benefit-cost ratio	1.41	1.30
Physical disabilities	<i>N</i>	5,396	9,498
	Net benefit	\$276.00	\$339.13
	Benefit-cost ratio	1.52	1.75
Intellectual disabilities	<i>N</i>	54,945	38,216
	Net benefit	\$139.25	\$116.07
	Benefit-cost ratio	1.22	1.17
TBI	<i>N</i>	1,717	2,690
	Net benefit	\$97.29	\$120.77
	Benefit-cost ratio	1.14	1.18
Autism	<i>N</i>	2,038	2,331
	Net benefit	\$290.20	\$290.01
	Benefit-cost ratio	1.62	1.61
Mental illnesses	<i>N</i>	30,606	37,803
	Net benefit	\$327.50	\$324.65
	Benefit-cost ratio	1.69	1.67
Communication disorders	<i>N</i>	394	902
	Net benefit	\$340.65	\$328.84
	Benefit-cost ratio	1.83	1.74
Other health impairments	<i>N</i>	3,196	5,529
	Net benefit	\$362.83	\$396.83
	Benefit-cost ratio	1.83	1.98
Other learning difficulties	<i>N</i>	13,889	13,468
	Net benefit	\$455.66	\$436.64
	Benefit-cost ratio	2.26	2.15
All supported employees	<i>N</i>	115,988	115,216
	Net benefit	\$249.72	\$263.46
	Benefit-cost ratio	1.46	1.49

Further, although the degree of cost-efficiency varied considerably across disability groups, as has been found by other authors (cf. Noble et al., 1991), supported employees funded by VR were cost-efficient regardless of their primary condition. Indeed, individuals with TBIs (the least cost-efficient of the groups examined) returned an average monthly net benefit to taxpayers of \$111.62 (i.e., annual net benefit of \$1,339.44 per supported employee) and had a mean benefit-cost ratio of 1.17, indicating that for every dollar of costs of funding supported employment, taxpayers received \$1.17 of benefits.

In addition, this study found that the presence of secondary conditions appeared to have little to no impact on the cost-efficiency to taxpayers, thus substantiating vocational rehabilitation's "order of selection" policy that requires the mostly severely affected individuals be service first. Specifically, supported employees with secondary conditions returned an average monthly net benefit of \$263.46 to taxpayers and had an average benefit-cost ratio of 1.49, whereas supported employees without secondary conditions generated an average monthly net benefit of \$249.72 and benefit-cost ratio of 1.46.

Taken together, the findings from this study provide ample economic validation for policies and procedures promoting inclusive employment options within the community for individuals with even the severest of disabilities. More precisely, this study determined that

funding supported employees, regardless of their disability or the number of their disabling conditions, was an economically appropriate decision from the taxpayers' perspective. The significance of these findings for both individuals with disabilities and the taxpayers in general cannot be understated.

According to Rusch and Braddock (2005), in 2002 approximately 483,000 individuals with disabilities were served in segregated placements at a gross cost to the federal government of \$488 million. If all of these individuals were provided services in their communities via supported employment and generated the same average returns on investment found here, taxpayers would have actualized a monthly net benefit of \$121.4 million. If this figure were extrapolated over a year, the annual benefit to taxpayers would be close to \$1.5 billion dollars. Moreover, greater numbers of individuals with disabilities would have experienced the monetary and nonmonetary benefits of working in inclusive environments that have been documented extensively elsewhere (cf. Kregel, Wehman, Revell, Hill, & Cimera, 2000). In other words, funding supported employment appears to be a "win-win" situation for both taxpayers and individuals with disabilities.

However, the results included here were not entirely positive for supported employment. An ancillary finding from this study is that supported employment did not provide workers with very high wages. According to figures

found in RSA's 911 database, the average supported employee served by VR from 2002 to 2007 earned less than \$700 per month in gross wages or roughly \$8,400 a year. This is hardly the economic windfall often promised individuals with disabilities enrolling in supported employment (Cimera & Rusch, 1999). Even when governmental subsidies are factored in, the average supported employee served by VR generated an annual income of approximately \$12,900, well below the poverty line of \$13,690 for a family of two in the 48 contiguous United States (U.S. Department of Health and Human Services, 2009). If supported employment is going to be a viable employment option for individuals with disabilities, it will need to secure positions in the community that pay above minimum wage and allow supported employees to earn a livable wage.

Another significant finding from this study was that most individuals examined increased their reliance on government subsidies because of supported employment. More precisely, the average supported employee received \$6.83 more per month in governmental subsidies after enrolling in supported employment than before they applied for VR services. This finding is not entirely new. Rusch et al. (1993) found a similar result in their data for 1989. This increase was likely caused by job coaches and VR counselors advocating for supported employees and encouraging them to apply for whatever assistance is available. Regardless of the cause, it is evident that supported employment does not reduce the need of governmental subsidies as reported by some authors (Cimera, 2000). Given the data presented here, the reverse appears to be true. However, even with this increase in governmental subsidies received, supported employment still returned a net benefit to taxpayers.

Although this study attempted to address the critical weaknesses in the available cost-efficiency literature, it contains several limitations that must be kept in mind when interpreting its findings. The first is that it only examined the monetary costs and benefits actualized by taxpayers because of VR funding supported employment. This study did not examine the perspective of other stakeholders (e.g., workers with disabilities) nor did it include nonmonetary variables, such as safety, happiness, or increases in self-worth, although such variables are critical when evaluating the merits of any program. The exclusion of nonmonetary outcomes is systemic with all cost-efficiency analyses, so this study is not uniquely disadvantaged in this respect.

Further, this study only explored monetary outcomes of individuals funded by VR. Supported employees funded by other programs, such as the Department of Mental Health, were not included within this study's scope. Future research will need to examine whether other funding mechanisms produce the same returns on investment identified here.

This study did not include the costs associated with providing follow along services to supported employees

because such services are not typically funded by VR. However, given that the cost of follow along services has been found to decrease over time while the costs associated with sheltered workshops remain relatively constant, the inclusion of follow along costs would not likely change this study's conclusions (Cimera, 2007b, 2008). In other words, the expenditures associated with follow along services (i.e., a cost to taxpayers) have been found to be less than the ongoing costs of sheltered workshops (i.e., a benefit to taxpayers). Thus, if follow along costs and the savings from not funding sheltered workshops would have been included within this analyses, supported employment would likely to have been even more cost-efficient to taxpayers given that the cost of follow along services would have been more than offset by the continued savings from not funding sheltered workshops (i.e., a benefit to taxpayers).

Finally, although based mostly upon direct data, this study made several assumptions when calculating the monetary benefits and costs of supported employment. For example, unlike previous studies that assumed that all employers of supported employees would claim TJTCs, this study estimated that only 75% of the employers would generate this cost to taxpayers. Given that recent research has suggested relatively few employers receive these tax credits (Cimera, 2009), the percentage used here is relatively conservative. Specifically, had this study estimated that only half of the employers received tax credits, the final benefit-cost ratio for all supported employees would have been 1.61 rather than 1.46 as reported here.

## Conclusions

Clearly, there is more to evaluating the merits of human service programs than merely investigating their monetary outcomes. Still, given the fiscal crisis facing the United States and other countries around the world, policymakers and politicians will be likely become more cautious as to how they invest the taxpayers' money. With this in mind, it would be advantageous for advocates of supported employment programs to reinvigorate the cost-analysis research that was once so common within the literature. Special attention needs to be focused on identifying methods of decreasing supported employment's costs while improving the outcomes achieved by its participants.

## References

- Baer, R., Simmons, T., Flexer, R., & Smith, C. (1995). A study of the costs and benefits of supported employees with severe physical and multiple disabilities. *Journal of Rehabilitation Administration, 18*, 46-57.
- Boardman, A. E., Greenberg, D. H., Vining, A. R., & Weimer, D. L. (2006). *Cost-benefit analysis: Concepts and practice*. Upper Saddle River, NJ: Pearson.
- Cho, D. W., & Schuermann, A. C. (1980). Economic costs and benefits of private gainful employment of the severely handicapped. *Journal of Rehabilitation, 46*, 28-32.

- Cimera, R. E. (1998). Are individuals with severe mental retardation and multiple disabilities cost-efficient to serve via supported employment programs? *Mental Retardation*, 36, 280-292.
- Cimera, R. E. (2000). The cost-efficiency of supported employment programs: A literature review. *Journal of Vocational Rehabilitation*, 14, 51-61.
- Cimera, R. E. (2007a). The cost-effectiveness of supported employment and sheltered workshops in Wisconsin: FY 2002-2005. *Journal of Vocational Rehabilitation*, 26, 153-158.
- Cimera, R. E. (2007b). The cumulative cost-effectiveness of supported and sheltered employees with mental retardation. *Research and Practice for Persons with Severe Disabilities*, 32, 1-6.
- Cimera, R. E. (2008). The cost-trends of supported versus sheltered employment. *Journal of Vocational Rehabilitation*, 28, 15-20.
- Cimera, R. E. (2009). The national costs of supported employment to vocational rehabilitation: 2002 to 2006. *Journal of Vocational Rehabilitation*, 30, 1-10.
- Cimera, R. E. (2010). Can community-based high school transition programs improve the cost-efficiency of supported employment? *Career Development for Exceptional Individuals*, 33(1), 4-12.
- Cimera, R. E., & Rusch, F. R. (1999). Empirical evidence on the long-term effectiveness of supported employment: A literature review. In L. M. Glidden (Ed.), *International research on mental retardation* (Vol. 22, pp. 175-226). San Diego: Academic Press.
- Conley, R. W., & Noble, J. H. (1990). Benefit-cost analysis of supported employment. In F. R. Rusch (Ed.), *Supported employment: Models, methods, and issues* (pp. 271-287). Sycamore, IL: Sycamore.
- Conley, R. W., Rusch, F. R., McCaughrin, W. B., & Tines, J. (1989). Benefits and costs of supported employment: An analysis of the Illinois supported employment project. *Journal of Applied Behavior Analysis*, 22, 441-447.
- Heal, L. W., McCaughrin, W. B., & Tines, J. J. (1989). Methodological nuances and pitfalls of benefit-cost analysis: A critique. *Research in Developmental Disabilities*, 10, 201-212.
- Hill, M., & Wehman, P. (1983). Cost benefit analysis of placing moderately and severely handicapped individuals in competitive employment. *Journal of the Association for the Severely Handicapped*, 8, 30-38.
- Hill, M. L., Banks, P. D., Handrich, R. R., Wehman, P. H., Hill, J. W., & Shafer, M. S. (1987). Benefit-cost analysis of supported competitive employment for persons with mental retardation. *Research in Developmental Disabilities*, 8, 71-89.
- Hill, M. L., Wehman, P. H., Kregel, J., Banks, P. D., & Metzler, H. M. D. (1987). Employment outcomes for people with moderate and severe disabilities: An eight-year longitudinal analysis of supported competitive employment. *Journal of the Association for the Severely Handicapped*, 12, 182-189.
- Johnston, M. V. (1987). Cost-benefit methodologies in rehabilitation. In M. J. Fuhrer (Ed.), *Rehabilitation outcomes: Analysis and measurement* (pp. 99-113). Baltimore: Brookes.
- Kregel, J., Wehman, P., & Banks, P. D. (1989). The effects of consumer characteristics and type of employment model on individual outcomes in supported employment. *Journal of Applied Behavior Analysis*, 22, 407-415.
- Kregel, J., Wehman, P., Revell, G., Hill, J., & Cimera, R. (2000). Supported employment benefit-cost analysis: Preliminary findings. *Journal of Vocational Rehabilitation*, 14, 153-161.
- Lam, C. S. (1986). Comparison of sheltered and supported work programs: A pilot study. *Rehabilitation Counseling Bulletin*, 30, 66-82.
- Levin, H. M., & McEwan, P. J. (2000). *Cost-effectiveness analysis: Methods and applications*. Sage: Thousand Oaks.
- Lewis, D. R., Johnson, D. R., Bruininks, R. H., Kallsen, L. A., & Guillery, R. P. (1992). Is supported employment cost-effective in Minnesota? *Journal of Disability Policy Studies*, 3, 67-92.
- McCaughrin, W. B. (1988). *Longitudinal trends of competitive employment for developmentally disabled adults: A benefit-cost analysis*. Unpublished doctoral dissertation, University of Illinois, Urbana-Champaign.
- McCaughrin, W. B., Ellis, W. K., Rusch, F. R., & Heal, L. W. (1993). Cost-effectiveness of supported employment. *Mental Retardation*, 31, 41-48.
- McCaughrin, W. B., Rusch, F. R., Conley, R. W., & Tines, J. (1991). A benefit-cost analysis of supported employment in Illinois: The first two years. *Journal of Developmental and Physical Disabilities*, 3, 129-145.
- Noble, J. H., Conley, R. W., Banerjee, S., & Goodman, S. (1991). Supported employment in New York state: A comparison of benefits and costs. *Journal of Disability Policy Studies*, 2, 39-74.
- Rehabilitation Services Administration. (2004). *Reporting Manual for the Case Service Report (RSA-911)* (Report No. RSA-PD-04-04). Washington, DC: Author.
- Rogers, E. S., Sciarappa, K., MacDonald-Wilson, K., & Danley, K. (1995). A benefit-cost analysis of a supported employment model for persons with psychiatric disabilities. *Evaluation and Program Planning*, 18, 105-115.
- Rusch, F. R., & Braddock, D. (2005). Adult day programs versus supported employment (1988-2002): Spending and service practices of mental retardation and developmental disabilities state agencies. *Research and Practice for Persons with Severe Disabilities*, 29, 237-242.
- Rusch, F. R., Conley, R. W., & McCaughrin, W. B. (1993). Benefit-cost analysis of supported employment in Illinois. *Journal of Rehabilitation*, 59, 31-36.
- Schneider, K., Rusch, F. R., Henderson, R., & Geske, T. (1981). Competitive employment for mentally retarded persons: Costs vs. benefits. In W. Halloran (Ed.), *Funding and cost analysis*. Urbana-Champaign: Leadership Training Institute, University of Illinois.
- Tax Form Processing LLC. (2009). *Social Security tax wages limits and rates and Medicare rates for tax year 2007*. Retrieved March 25, 2009, from [http://www.taxformprocessing.com/tax/news/2007/ss\\_medicare.htm](http://www.taxformprocessing.com/tax/news/2007/ss_medicare.htm).
- Thompson, L., Powers, G., & Houchard, B. (1992). The wage effects of supported employment. *Journal of the Association for Persons with Severe Handicaps*, 17, 87-94.
- Tines, J., Rusch, F. R., McCaughrin, W., & Conley, R. W. (1990). Benefit-cost analysis of supported employment in Illinois: A statewide evaluation. *American Journal on Mental Retardation*, 95, 44-54.
- U.S. Department of Health and Human Services. (2009). *The 2007 HHS poverty guidelines*. Retrieved April 8, 2009, from <http://aspe.hhs.gov/poverty/07poverty.shtml>.
- Wehman, P., Hill, J. W., Wood, W., & Parent, W. (1987). A report on competitive employment histories of persons labeled severely mentally retarded. *Journal of the Association for the Severely Handicapped*, 12, 11-17.
- Wehman, P., Hill, M., Hill, J., Brooke, V., Pendleton, P., & Britt, C. (1985). Competitive employment for persons with mental retardation: A follow-up six years later. *Mental Retardation*, 23, 274-281.
- Wehman, P., Kregel, J., Keyser-Marcus, L., Sherron-Targett, P., Campbell, L., West, M., et al. (2003). Supported employment for persons with traumatic brain injury: A preliminary investigation of long-term follow-up costs and program efficiency. *Archives of Physical Medicine and Rehabilitation*, 84, 192-196.
- Zivolich, S., Shueman, S. A., & Weiner, J. S. (1997). An exploratory cost-benefit analysis of natural support strategies in the employment of people with severe disabilities. *Journal of Vocational Rehabilitation*, 8, 211-221.

Received: April 19, 2009

Final Acceptance: February 2, 2010

Editor in Charge: Craig A. Michaels

Copyright of Research & Practice for Persons with Severe Disabilities is the property of TASH and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.