

# The cost-efficiency of supported employment programs: A literature review

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Twenty-one studies on the cost-efficiency of supported employment were reviewed to answer three questions: (a) "Is supported employment cost-efficient?" (b) "Are supported employees with severe or multiple disabilities cost-efficient?" and (c) "Are certain models of supported employment more cost-efficient than others?" This review concluded that supported employment is eventually cost-efficient from the worker's and taxpayer's perspectives. Further, all supported employees are cost-efficient, however, individuals with mild mental retardation are more cost-efficient than individuals with severe mental retardation. Finally, although literature is sparse, individual placements appear to be the most cost-efficient methods of supported employment.

Keywords: Supported employment, cost-efficiency, cost-effectiveness, review of literature

## 1. The cost-efficiency of supported employment programs: A literature review

Social programs, no matter how popular or effective, are being judged more by their economic appeal than their programmatic achievements. In other words, with the growing federal debt, the importance of showing policy makers that social programs are good investments cannot be overstated. It is most likely for this reason that a significant amount of attention has been focused upon the cost-efficiency of employment programs for individuals with disabilities (e.g., supported employment programs).

The purpose of this endeavor is to review the literature relating to the cost-efficiency of supported employment programs. Specifically, the literature was

reviewed to answer the following three questions. First, "Is supported employment cost-efficient, overall?" Second, "Are individuals with severe and multiple disabilities cost-efficient to serve via supported employment?" Finally, "Are various models of supported employment (i.e., individual placement, mobile work crews, and enclaves) more cost-efficient than others?"

Cost-efficiency in these questions were examined from two cost-accounting perspectives: (a) the worker's perspective (i.e., the perspective of the supported employee) and b) the taxpayer's perspective. Twenty-one studies published in American journals since 1980 were identified and reviewed for this investigation (see Table 1). Five of these [2,15,16,25,32] were not cost-efficiency studies per se, but studies that presented data necessary for cost-efficiency analyses (e.g., the costs of supported employment programs). Because of their importance to the literature base, they were included within the present analyses.

### 1.1. A brief overview of cost-efficiency

Cost-efficiency studies seeks to answer the question: "Do the monetary benefits of a decision (e.g., buying an automobile, funding employment programs for individuals with disabilities, etc.) outweigh the resulting monetary costs?" [13]. This is done by utilizing a structured accounting procedure that identifies all the benefits and costs associated with the decision, converts these benefits and costs into monetary units, and then formulates benefit-cost ratios based upon a specific cost-accounting perspective [28].

### 1.2. Cost-accounting perspectives

Denoting the cost-accounting perspective is essential because outcomes of a decision (e.g., taxes paid) can be both a benefit as well as a cost from different perspectives (see Table 2). For instance, taxes paid are costs to supported employees because they reduce the amount of money available for the supported employees to spend. However, taxes paid are benefits to

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Table 1  
Cost-efficiency and related studies reviewed

1. Cho and Schuermann (1980)
2. Brickey and Campbell (1981)
3. Schneider, Rusch, Henderson and Geske (1981) <sup>a</sup>
4. Hill and Wehman (1983)
5. Wehman, Hill, Hill, Brooke, Pendleton and Britt (1985) <sup>b</sup>
6. Lam (1986) <sup>c</sup>
7. Hill, Banks, Handrich, Wehman, Hill and Shafer (1987)
8. Hill, Wehman, Kregel, Banks and Metzler (1987)
9. Schloss, Wolf and Schloss (1987) <sup>b</sup>
10. Kregel, Wehman and Banks (1989) <sup>b</sup>
11. Conley, Rusch, McCaughrin and Tines (1989)
12. Tines, Rusch, McCaughrin and Conley (1990)
13. Noble, Conley, Banjerjee and Goodman (1991)
14. McCaughrin, Rusch, Conley and Tines (1991)
15. Lewis, Johnson, Bruinkins, Kallsen and Guillery (1992)
16. Thompson, Powers and Houchard (1992)
17. McCaughrin, Rusch, Conley and Tines (1993)
18. Rusch, Conley and McCaughrin (1993)
19. Baer, Simmons, Flexer and Smith (1995)
20. Zivolich, Shueman and Weiner (1997)
21. Cimera (1998a)

<sup>a</sup>Schneider et al. (1981) presented a cost-efficiency study from the societal perspective which combines the perspectives of the worker and taxpayer.

<sup>b</sup>Wehman et al. (1985), Schloss et al. (1987) and Kregel et al. (1989) were not cost-efficiency studies, but were included within the present review of the literature due to the important information contained within these studies regarding the benefits earned by supported employees.

<sup>c</sup>Lam (1986) was not a cost-effectiveness study, but was included within this analysis due to its comparison of individuals with mild and severe disabilities.

taxpayers since they increase the amount of revenue that can be spent improving the taxpayers' community (e.g., via repairing roads).

### 1.2.1. Cost-efficiency formulae

Once the cost-accounting perspectives have been selected and the benefits and costs related to the decision have been converted to monetary units, benefit-cost ratios are calculated. There are several methods of calculating benefit-cost ratios. For instance, dividing net benefits (i.e., gross benefits minus gross costs) by the sum of all benefits and costs (i.e., gross benefits plus gross costs) produces a benefit-cost ratio between  $-1.00$  and  $+1.00$ . When using this formula, a supported employment program with a positive benefit-cost ratio (e.g.,  $+1.10$ ) would be cost-efficient (i.e., monetary benefits exceed monetary costs). A supported employment program with a negative benefit-cost ratio (e.g.,  $-1.10$ ) would be cost-inefficient (i.e., monetary costs exceed monetary benefits). Further, benefit-cost ratios of  $+1.00$  and  $-1.00$  indicate that programs have no costs or no benefits, respectively.

A more common method of calculating benefit-cost ratios is to divide gross monetary benefits by gross monetary costs. With this method, ratios exceeding  $1.00$  indicate cost-efficiency, while ratios less  $1.00$  indicate cost-inefficiency. Unlike the previous method, this formula produces an infinite range of benefit-cost ratios. For example, if a supported employment program produced  $\$1,000,000$  in benefits and cost taxpayers  $\$1$ , the resulting benefit-cost ratio would be  $1,000,000$  (i.e.,  $\$1,000,000/\$1$ ). Utilization of the previous formula in this example would have yielded a benefit-cost ratio of  $.999998$  (i.e.,  $\$999,999/\$1,000,001$ ).

### 1.2.2. Limitations of cost-efficiency studies

Regardless of which formula is utilized, cost-efficiency studies have several key limitations. Primary among them is that cost-efficiency methodologies cannot evaluate non-monetary benefits and costs (e.g., improved worker happiness or increased quality of life). Program outcomes such as happiness and quality of life comprise the philosophical foundation for the creation of supported employment, yet they cannot be entered into cost-efficiency calculations. Thus, cost-efficiency studies may underestimate the actual benefits of supported employment programs.

A second shortcoming of cost-efficiency studies is that they do not indicate how much money, if any, should be invested in supported employment programs. For instance, even if every study reviewed determined that supported employment was cost-efficient from the taxpayer's perspective, policy makers would still not know how much revenue would optimize the taxpayer's investment in these programs. In other words, funds earmarked for supported employment can reach a point of dwindling returns where an additional dollar invested would not return as much to workers or taxpayers as the previous dollar invested. There is a point where even cost-efficient programs cease to be prudent investments. Cost-efficiency studies cannot determine where the point of dwindling returns is, nor whether it has already been crossed.

### 1.3. The cost-efficiency of supported employment programs

Of the 21 studies reviewed, all presented information on the monetary benefits and costs generated by supported employment programs (see Table 3). Six examined these benefits and cost exclusively from the worker's perspective, three solely from the taxpayer's perspectives. The remaining studies presented analy-

Table 2  
Typical benefits and costs of supported employment by perspective

Cost-accounting variable	Worker's perspective	Taxpayer's Perspective
Wages earned	Benefit	—
Wages forgone	Cost	—
Fringe benefits	Benefit	—
Reduced governmental subsidies	Cost	Benefit
Taxes paid	Cost	Benefit
Supported employment operating costs	—	Cost
Forgone operating costs (e.g., sheltered workshops)	—	Benefit
Tax credits given to employers	—	Cost

ses from both perspectives. Below, presented by cost-accounting perspective (i.e., worker and taxpayer), are the findings of these studies with regard to the overall cost-efficiency of supported employment programs.

### 1.3.1. Worker's perspective

Of the 18 studies reviewed that investigated the worker's perspective, 15 found that supported employment was cost-efficient. That is, 83% of the studies reviewed concluded that the financial rewards (e.g., wages earned) of being employed via supported employment exceed the resulting costs (e.g., reduced government subsidies). Specifically, most studies found that supported employees earned more wages in the community than in sheltered workshops or other alternative programs (e.g., developmental training). Further, these increases in wages earned more than offset the taxes paid by supported employees as well as the government subsidies (e.g., SSI) typically lost when individuals with disabilities become competitively employed.

However, it is unclear in the literature how frequently individuals lose government subsidies as a consequence of becoming employed via supported employment programs. In fact, Rusch et al. [23] found that supported employees experienced an increase in government subsidies received after enrolling in supported employment programs. These authors theorized that job coaches assisted supported employees in obtaining the maximum amount of subsidies that they were entitled. Conversely, other authors (cf. [9,29,31]) found that workers experienced a significant decrease in the amount of subsidies received after enrolling in supported employment programs. These variations maybe explained by changes in how governmental agencies (e.g., Social Security Administration) determine eligibility for subsidies as noted by Schloss et al. [24,25] and Knapp [14]. These changes make cost-efficiency calculations involving subsidies difficult and quickly outdated.

Brickey and Campbell [2] illustrated the importance of determining the potential impact that competi-

itive employment has upon governmental subsidies received. These authors found that workers who had lost all of their Social Security (SS) and Supplemental Security Income (SSI) benefited more from working in sheltered workshops (net yearly income: \$3,490) than supported employment programs (net yearly income: \$2,475). Further, Brickey and Campbell found that individuals who were unemployed had greater net yearly incomes than supported employees who lost all of their governmental subsidies (\$2,498 verse \$2,475, respectively). Supported employees who retained part of their SS and SSI, however, benefited more than sheltered employees who received the maximum amounts of SS and SSI that they were allowed (net yearly income: \$3,833 v. \$3,490, respectively).

Similar to Brickey and Campbell [2], Lam [16] and Thompson et al. [27] also concluded that supported employment programs were not always cost-efficient from the worker's perspective. Both Lam and Thompson et al. found that individuals with disabilities often worked more hours in sheltered workshops than in the community. Specifically, Lam found that the average sheltered employee in his study worked roughly 25 hours per week, compared to 15 hours a week worked by supported employees. Even though supported employees in Lam's study earned more per hour than sheltered employees, sheltered employees generated more wages than supported employees. Additionally, Thompson and colleagues found that sheltered workshops offered workers more wages in three out of 11 fiscal quarters (27%) investigated.

The findings of Lam [16] and Thompson et al. [27] raise an important question. Specifically, how is "work" defined when applied to sheltered workshops? Workshops have often been accused of providing participants with training activities that differ significantly from paid tasks available within the community [22]. If this is accurate, comparisons between sheltered workshops and supported employment might not be valid. Still, the issue of number of hours worked verses hourly rate of pay may be a central issue to individuals living

in group homes who require positions offering certain work hours (e.g., 9 a.m. to 5 p.m.) or individuals who do not wish to lose their medical benefits as a result of increased earnings.

In summary, questions still remain as to how supported employees generate their net monetary rewards. For instance, governmental subsidies may or may not decrease as a result of competitive employment within the community. Further, some supported employees have been found to experience fewer hours of worked than sheltered employees. However, the majority of research reviewed concluded that supported employment was cost-efficient from the worker's perspective; that is, individuals with disabilities experienced more monetary benefits than monetary costs when enrolled in supported employment programs.

#### *1.3.2. Taxpayer's perspective*

From the 13 studies reviewed that examined the taxpayer cost-efficiency of supported employment programs, three different findings were disseminated. Specifically, six studies determined that supported employment programs were cost-efficient from the taxpayer's perspective, five found that supported employment programs were inefficient, and two found that supported employment was sometimes efficient and sometimes inefficient. Despite this fragmentation of findings, there is general agreement in the literature that, over time, supported employment is a good investment for taxpayers. Evidence for this conclusion can be illustrated in two ways.

First, when examined over several years, the monetary benefits of supported employment programs have been shown to increase while the monetary costs decrease [18,19,23]. Second, all studies that examined supported employment cost-efficiency for four years or more [10–12,18,32] found that supported employment is cost-efficient from the taxpayer's perspective. Combined, these findings seem to explain the results of studies indicating that supported employment programs were not cost-efficient in their first years of operation (cf. [9,17,19,29]). In other words, the primary appeal of supported employment to taxpayers is its ability to generate long-term increasing benefits while producing fundamentally short-term costs.

#### *1.4. The effect of severity or number of disabilities on cost-efficiency*

Eight studies examined whether it was cost-efficient to serve individuals with severe or multiple disabili-

ties via supported employment programs. All eight of these studies utilized the worker's perspective, while six examined cost-efficiency from the perspective of the taxpayer (see Table 3). Results are discussed below.

##### *1.4.1. Worker's perspective*

From the eight studies that examined the relationship between severity of disability and worker cost-efficiency, three areas of contention were identified. The first involved the direction of the relationship between IQ and worker cost-efficiency. Five studies [1,6,16,18,27] found a positive relationship between level of mental retardation and worker cost-efficiency. That is, as IQ increased, so did the cost-efficiency of supported employees. In these studies, supported employees with mild mental retardation generated more net monetary benefits than supported employees with moderate, severe, or profound mental retardation.

However, three studies [11,12,15] found either a negative relationship (i.e., worker cost-efficiency increased as worker IQ decreased) or no clear relationship at all. Specifically, Kregel et al. found that while supported employees with mild mental retardation earned more than supported employees with severe mental retardation, supported employees with moderate mental retardation earned more than supported employees with mild mental retardation. Similar conclusions were reached by Hill et al. [12] who determined that supported employees with moderate or severe mental retardation earned more in the community than peers with mild mental retardation.

There are several potential explanations for these diverse findings. First, Hill et al. [11,12] have been criticized for under-estimating forgone earnings, thereby inflating the benefits of supported employment experienced by workers [7,21]. Further, Hill et al. [12] compared the total wages earned by supported employees in a high IQ cohort (i.e., supported employees with mild mental retardation) to supported employees in a low IQ cohort (i.e., supported employees with moderate or severe mental retardation). However, these two cohorts differed in the number of months worked (17 v. 24.6, respectively). Had Hill et al. [12] adjusted their data to reflect average earnings per month instead of total wages earned, supported employees with mild mental retardation would have earned more than supported employees with lower IQs (\$637.21 v. \$527.47, respectively). With this adjustment, Hill et al.'s findings would have corroborated the notion that worker cost-efficiency is positively associated with level of mental retardation.

Table 3. continued

Citation	Scope (region data time frame (sample size))	Supported Employment Cost-Efficiency perspectives (worker taxpayer)		Level of Mental Retardation and Cost-Efficiency perspectives (worker taxpayer)		Supported Employment Models <sup>1, 5</sup> perspectives (worker taxpayer)
Cimera (1998a)	Illinois 1990 and 1994 ( <i>n</i> = 111 and 57)	↑	↑	↑	~	

“↑” indicates that supported employment was found to be cost-efficient (i.e., benefit-cost ratio exceeding 1.0).

“↓” indicated that supported employment was found to be cost-inefficient (i.e., benefit-cost ratio less than 1.0).

“↔” indicates that supported employment was sometimes found to be cost-efficient and sometimes cost-inefficient.

“↑” indicates that there was a positive relationship between worker IQ and cost-efficiency (e.g., individuals with mild mental retardation were more cost-efficient than individuals with severe mental retardation).

“↓” indicates that there was a negative relationship between worker IQ and cost-efficiency (e.g., individuals with severe mental retardation were more cost-efficient than individuals with mild mental retardation).

“~” indicates that there was no relationship between supported employee intelligence and cost-efficiency.

*I* > *G* indicates that “individual placements” were more cost-efficient than “group placements”.

*G* > *I* indicates that “group placements” were more cost-efficient than “individual placements”.

<sup>1</sup>Supported employment models are categorized as “individual” versus “group” (i.e., enclaves, mobile work crews).

<sup>2</sup>Schneider et al. (1981) projected cost-efficiency over a 20-year period based upon the first two years of operation.

<sup>3</sup>Lam (1986) found that, in general, supported employment was not cost-effective, however, this was determined by level of mental retardation.

<sup>4</sup>Schloss et al. (1987) found that being employed part-time was more beneficial than working full-time or not at all.

<sup>5</sup>Supported employment models are categorized as “individual” versus “group” (i.e., enclaves, mobile work crews).

<sup>6</sup>Lewis et al. (1992) found that supported employment was cost-efficient 64% of the time.

<sup>7</sup>Lewis et al. (1992) found that individual placements were more cost-efficient than group placements 82% of the time.

<sup>8</sup>Thompson et al. (1992) found that supported employment offered more wages than workshops 82% of the time.

<sup>9</sup>Zivolich et al. (1997) found that supported employment was cost-efficient if forgone workshop costs were considered a benefit to taxpayers, without these costs supported employment was inefficient.

Second, Kregel et al. [15] was not a true cost-efficiency study, but instead focused only upon monthly earnings of supported employees. Since wages earned are merely one component of benefit-cost ratios, it is unclear whether the cost-efficiency of supported employees in Kregel et al.’s study would have been affected by magnitude of disability. In other words, even though individuals with moderate mental retardation in Kregel et al.’s study earned more than individuals with mild mental retardation, supported employees with moderate mental retardation may have paid more taxes and lost more governmental subsidies than their peers – thus decreasing the net benefits experienced by supported employees with moderate mental retardation.

The second area of contention identified from the eight studies that examined the relationship between severity of disability and worker cost-efficiency involved the best placement for individuals with severe disabilities. Specifically, Cimera [6] and McCaughrin et al. [18] found that, regardless of severity of disability, all individuals were more cost-efficient in community than within sheltered workshops. In other words, workers with disabilities of all severities earned greater net benefits via supported employment programs than sheltered workshops.

Lam [16], however, found that individuals with moderate or severe mental retardation were better served via sheltered workshops than supported employment programs. More precisely, Lam found that individuals with moderate or severe mental retardation worked more hours and were paid more per hour in sheltered workshops than in supported employment. There are several explanations for these different findings.

One of the potential explanations for why Cimera [6] and McCaughrin et al. [18] reached different conclusions than Lam [16] involves the studies’ samples. Lam has been criticized for making comparisons using a sample of 50 non-typical supported employees [8]. For instance, the average hourly wage earned by supported employees in Lam’s overall sample was \$1.79; supported employees with moderate or severe mental retardation in Lam’s sample earned \$0.69 per hour. Other studies published during the same year as Lam found that supported employees earned an average of \$3.49 to \$4.05 per hour [20,30]. It is unclear why Lam’s sample differed so significantly from other studies. Had Lam’s sample been more representative of supported employees across the country, his findings would likely mirror those of Cimera [6] and McCaughrin et al. [18].

Another potential explanation for the differences between Lam [16], McCaughrin et al. [18] and Cimera [6], involves the length of time data were gathered for each study. Findings from Cimera's study were based upon data that were gathered during two non-consecutive years, as were McCaughrin et al.'s findings. Conclusions from Lam [16], however, were based upon data collected over three months. Lam's underrepresentation of the monetary gains made by supported employees may be an artifact of this brief data collection period. Perhaps participants in Lam's study were still in their initial training phase, and consequently had yet to reach their full employment potential, thus limiting the monetary benefits that they experienced.

The third area of contention identified from the supported employment literature involved the number of disabilities possessed by supported employees. Cimera [6] found that individuals without multiple disabilities benefited more from being employed within the community than individuals with multiple disabilities. All individuals, however, were better served via supported employment programs than sheltered workshops. No other reviewed study examined worker cost-efficiency and multiple disabilities.

In summary, many conflicting findings were documented in the eight studies that examined the effects of severity and number of disabilities on worker cost-efficiency. However, two conclusions may be drawn. The first is that individuals with higher IQs appear to benefit more monetarily from being enrolled in supported employment programs than individuals with lower IQs. The second conclusion is that all individuals, regardless of severity of disability, experience greater monetary benefits than monetary costs. In other words, all supported employees are cost-efficient from the worker's perspective.

#### *1.4.2. Taxpayer's perspective*

Of the five studies that examined the relationship between severity of disability and taxpayer cost-efficiency, four (i.e. [1,12,18,21]) found a positive association. That is, cost-efficiency from the taxpayer's perspective increased with the IQ of the supported employee. The remaining study [6] found no significant correlation between IQ and taxpayer cost-efficiency, indicating that supported employees with profound mental retardation were as cost-efficient to serve from the taxpayer's perspective as supported employees with mild mental retardation.

Reasons for these different findings most likely involve the methods utilized. Specifically, Cimera [6]

used correlations to determine relationships. All other studies relied upon descriptive statistics. These differences might explain how Cimera reached one conclusion while all other studies reached another. For instance, suppose that supported employees with mild mental retardation averaged a benefit-cost ratio of 1.50 while supported employees with severe mental retardation averaged 1.45. Studies utilizing descriptive statistics (e.g. [18]) would have reported that individuals with mild mental retardation were more cost-efficient than individuals with severe mental retardation even though these differences may not have been statistically significant as might have been reported by Cimera [6].

Another difference exhibited within the literature relates to whether supported employees with severe mental retardation were better served from the taxpayer's perspective in sheltered workshops or supported employment programs. Cimera [6], Hill et al. [12], and McCaughrin et al. [18] found that all individuals, regardless of severity of disability, were cost-efficient to serve via supported employment. In other words, for every dollar that taxpayers invested in supported employment programs, supported employees returned more than a dollar in the form of taxes withheld and reduction in government subsidies. Noble et al. [21], on the other hand, found that no individuals were cost-efficient from the taxpayer's perspectives (i.e., monetary costs exceed monetary benefits).

A similar disagreement was found regarding individuals with multiple disabilities. Noble et al. [21] determined that supported employees with secondary disabilities were less cost-efficient from the taxpayer's perspective than supported employees without secondary disabilities. Cimera [6], on the other hand, found that – although there was no relationship between taxpayer cost-efficiency and number of disabilities – all supported employees were cost-efficient to be served via supported employment programs.

Variations in methodological could explain the different conclusions reached by Cimera [6] and Noble et al. [21]. The most important of these involved the samples utilized by each study. For instance, approximately 45% of the sample examined by Noble and colleagues were individuals waiting to be placed within the community and, thus, could not be considered supported employees. The inclusion of unemployed individuals decreases the amount of benefits experienced by taxpayers since these 'supported employees' were not earning a wage, paying taxes, or reducing their governmental subsidies. As a result, the cost-efficiency reported by Noble et al. is likely to be suppressed relative to the findings of Cimera [6] who investigated only employed supported employees.

### 1.5. Models of supported employment and cost-efficiency

Two of the reviewed studies [15,17] examined the cost-efficiency of various models of supported employment (e.g., individual placement, enclaves, mobile work crews). Both of these studies examine cost-efficiency from the worker's perspective. Only Lewis et al. [17] examined taxpayer cost-efficiency.

#### 1.5.1. Worker's perspective

Lewis et al. [17] found that individual placements were more cost-efficient from the worker's perspective than group placements. These results were due to the higher hourly wages and more hours worked in individual placement than group placements. Like Lewis et al., Kregel et al. [15] also found that individual placements resulted in higher hourly wages (\$3.68) than enclaves (\$3.25), work crews (\$2.32), and the small business approach to supported employment (\$1.30). However, according to Kregel et al., individuals in work crews and enclaves worked more hours per week than persons in individual placements (28.7, 27.6, and 26.5, respectively). Despite the fewer hours of work, supported employees placed individually in Kregel et al.'s study earned more per month (\$424) than supported employees in any other placement approach (enclaves: \$301; work crews: \$253; small business: \$149).

In summary, both Kregel et al. [15] and Lewis et al. [17] found that individual placements yielded greater net benefits than group placements. However, there is disagreement as to whether group placements furnished more hours worked than individual placements. As Lewis and colleagues noted, variations between, and within, states might explain the differences between the two studies. Local availability of, and demand for, labor might be responsible for these divergent findings.

#### 1.5.2. Taxpayer's perspective

Eighty-two percent of the individual placements examined by Lewis et al. [17] were found to be cost-efficient from the taxpayer's perspective. However, no indication is given as to how often group placements were cost-efficient from the taxpayer's perspective. With the exception of program costs generally being lower in individual programs than group placements, no other information was provided by Lewis et al. regarding the cost-efficiency of supported employment models.

## 2. Discussion

This paper examined the cost-efficiency literature on supported employment. Twenty-one studies published in American journals since 1980 were reviewed in relation to three questions. First, "Is supported employment cost-efficient?" Second, "Are individuals with severe or multiple disabilities cost-efficient to serve via supported employment programs?" Third, "Are some models of supported employment (i.e., individual placement, mobile work crews, and enclaves) more cost-efficient than others?" These questions were examined from two cost-accounting perspectives, the perspective of the worker (i.e., supported employee) and the taxpayer. Findings from this literature review are presented below by each of these perspectives.

### 2.1. Worker's perspective

For workers with disabilities, two primary conclusions seem apparent from the literature. The first is that, generally, supported employment programs offer greater net monetary benefits to individuals with disabilities than sheltered workshops (i.e., supported employment is more cost-efficient than sheltered workshops from the worker's perspective). However, it is unclear whether individuals with severe disabilities generate positive financial gains from being employed within the community. Some studies have indicated that these individuals were cost-efficient in the community (e.g. [18]), whereas others concluded that they were better served in sheltered workshops (e.g. [16]). Further, there is scant research on the impact of multiple disabilities on worker cost-efficiency (cf. [6]).

The second conclusion arrived at from the literature is that workers tend to generate more revenue via individual placements, but might work more hours via group placements (e.g., mobile work crews, enclaves). However, the long-term monetary benefits and costs of group and individual placements has yet to be explored. Thus, selecting the appropriate placement approach would depend upon the particular needs of the individual worker.

### 2.2. Taxpayer's perspective

From the review of the literature, three conclusions can be drawn regarding the cost-efficiency of supported employment programs from the taxpayer's perspective. The first is that, over time, supported employment appears to be a good investment. Several studies (cf. [9,

19,23]) have found that supported employment is not initially cost-efficient from the taxpayer's perspective. As individuals remain employed within the community, however, the cost-efficiency of supported employment programs increase so that, by approximately the fourth year of operation, taxpayers experience a positive net benefit.

The second conclusion from the literature involves the cost-efficiency of individuals with severe or multiple disabilities. Methodological differences make direct comparisons of studies difficult; nonetheless, it appears that individuals with severe mental retardation are cost-efficient to serve via supported employment programs in the long-run. In most studies, supported employees with severe mental retardation, however, were found to earn less – and are less cost-efficient – than supported employees with mild mental retardation.

The third conclusion from the literature review involves the cost-efficiency of individual versus group placements (e.g., enclaves). Only one study [17] has examined this issue. It was found that, during a one year analyses, individual placements were more cost-efficient than group placements in 82% of the cases examined. This result is somewhat surprising since group placements might offer taxpayers lower operation costs compared to individual placements. For instance, individual placements typically have one supported employee per job coach. Group placements, however, might have five or six supported employees per job coach, thus reducing the per capita cost of the program. On the other hand, individual models of supported employment allow for job coaches to fade from work sites, thus reducing costs to taxpayers over time. Additional studies are needed to further explore these issues.

### 2.3. Implications

The principal implication of this literature review is that it gives credence to the notion of revitalizing the supported employment movement – a movement said to be in decline [33]. As more and more students with disabilities exit high school each year, promotion of competitive employment within the community makes sound philosophical and financial sense. Competitive employment not only benefits workers in monetary terms (e.g. wages earned), but also in relation to making friends, increasing self-esteem, and empowering students to live the lives that they choose.

Re-energizing the supported employment movement would benefit the taxpayer as well. Competitive em-

ployment helps supported employees become less dependent upon governmental subsidies (e.g., Social Security) and enables them to become taxpaying citizens. Both outcomes increase the return on the taxpayer's investment.

Another implication stemming from this literature review relates to the "order of selection" policy discussed in the Rehabilitation Act of 1973. This policy mandates that individuals with severe disabilities be served by vocational rehabilitation prior to individuals with less intensive disabilities. Results from the present review offer some evidence that such a policy is economically appropriate from the perspective of both the worker and taxpayer.

### 2.4. Future areas of research

Although the topic of cost-efficiency is well cultivated in the supported employment literature, there are several important areas that require future research. Five are discussed below.

#### 2.4.1. Models of supported employment

Given that the cost-efficiency of supported employment programs may vary depending upon the model used, determining which model of supported employment is best for taxpayers and workers would seem to be a priority for future research. Future research could examine the long-term nature of cost-efficiency via group and individual placements. Specifically, this avenue of research could attempt to determine if wages and operating costs change overtime for group and individual placements.

#### 2.4.2. National representation

As Lewis et al. [17] found, cost-efficiency of supported employment programs appears to vary within and between states. This is not only because of variation between programs, but also differences in how programs are funded. As a result, studies from one state may not generalize to another study. Currently, only one study [15], has investigated supported employment cost-efficiency from multiple states (i.e., eight). Further, the majority of studies reviewed were conducted in either Illinois [6,9,18,19,23,26,29]. In order to understand the national impact of supported employment on worker and taxpayer cost-efficiency, a study with a nation-wide sample will need to be conducted.

### 2.4.3. Longitudinal studies

With the exception of Cimera [6] and Schneider et al. [26], none of the studies reviewed investigated the long-term cost-efficiency of supported employment (i.e., 10 years or more). However, the long-term analyses of these studies were based upon projections from only two years of data. In order to better estimate the long-term cost-efficiency of supported employment, data will need to be collected over the entire working lives of supported employees. The long-term cost-efficiency of supported employment programs can only be obtained by examining the costs and benefits generated by supported employees as they change and maintain employers.

### 2.4.4. Employer's perspective

Many studies have explored the cost-efficiency of supported employment from the perspectives of the worker, taxpayer, and society (not reviewed here). However, there has yet to be a comprehensive cost-efficiency study from the perspective of those who employ supported employees [7]. Such a study would examine whether hiring workers with disabilities is a good investment for employers.

Increasing cost-efficiency. Future research endeavors should focus upon how to increase supported employment's cost-efficiency. Specifically, studies that examine various training strategies, such as "natural supports" [6,35], or funding mechanisms, such as "consumer-base vouchers", need to be conducted [5]. Only by developing ways of enhancing the cost-efficiency of supported employment can researchers help insure supported employment's future.

## 3. Conclusions

Cost-efficiency studies attempt to determine whether monetary benefits of a decision exceed the resulting monetary costs. After reviewing 21 studies, it was concluded that, over time, supported employment was cost-efficient from the perspective of the worker and the taxpayer. In other words, for every \$1 of costs taxpayers and workers invest into supported employment, more than \$1 is returned in the form of monetary benefits. Cost-efficiency was demonstrated for all individuals, including those with severe disabilities, although these individuals were less cost-efficient than peers with mild disabilities. Finally, supported employees in individual placements appear to be more cost-efficient than those placed via group placements (e.g. enclaves and mobile work crews), although additional research is required in this area.

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Table 3  
Findings of supported employment benefit-cost literature

Citation	Scope (region data time frame (sample size))	Supported Employment Cost-Efficiency perspectives (worker taxpayer)	Level of Mental Retardation and Cost-Efficiency perspectives (worker taxpayer)	Supported Employment Models <sup>1,5</sup> perspectives (worker taxpayer)
Cho and Schermann (1980)	unknown 39 months ( <i>n</i> = 34)	↑		
Brickey and Campbell (1981)	none none (none)	↔		
Schneider et al. (1981)	Illinois 2 years <sup>2</sup> ( <i>n</i> = 22)		↑	
Hill and Wehman (1983)	Virginia 47 months ( <i>n</i> = 90)		↑	
Wehman et al. (1985)	Virginia 75 months ( <i>n</i> = 167)	↑	↑	
Lam (1986)	unknown 3 months ( <i>n</i> = 100)	↓ <sup>3</sup> ↔	↑	
Schloss et al. (1987)	none none (none)	↑ <sup>4</sup>		
Hill et al. (1987) Hill, Wehman et al. (1987)	Virginia 94 months ( <i>n</i> = 214 and 117)	↑	↑	↓
Kregel et al. (1989)	Eight States 1 month ( <i>n</i> = 1,550)	↑		~
Conley et al. (1989) Tines et al. (1990)	Illinois 1 year ( <i>n</i> = 394)	↑	↓	
Noble et al. (1991)	New York 21 months ( <i>n</i> = 1,100+)	↑	↓	↑
McCaughrin et al. (1991)	Illinois 2 years ( <i>n</i> = 588)	↑	↓	
Lewis et al. (1992)	Minnesota 1 year ( <i>n</i> = 856)		↔ <sup>6</sup>	<i>I</i> > <i>G</i> <i>T</i> > <i>G</i> <sup>7</sup>
Thompson et al. (1992)	Michigan 44 months ( <i>n</i> = 2,400+)	↔ <sup>8</sup>	↑	
McCaughrin et al. (1993)	Illinois 1 and 5 years ( <i>n</i> = 20)	↑	↑	↑
Rusch et al. (1993)	Illinois 3 years ( <i>n</i> = 729)	↑	↓	
Baer et al. (1995)	Ohio unknown ( <i>n</i> = 48)	↑	↓	↑
Zivolich et al. (1997)	California 7 months ( <i>n</i> = 48)	↑	↔ <sup>9</sup>	