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Cost-Benefit Analysis of Vocational Rehabilitation Program for Persons with Significant Disabilities in Korea¹

Summary

The purpose of this study is to analyze the economic effect of the vocational rehabilitation support services that have been provided by the Ministry of Health and Welfare since 2001 to support the employment of persons with significant disabilities. The study aims to propose how to invest limited resources into the vocational rehabilitation programs to expand employment opportunities of people with significant disabilities. Estimated costs and benefits of vocational rehabilitation programs were based on an analysis 12,381 individuals who had participated in Korea's vocational rehabilitation program for persons with significant disabilities and whose cases were closed in fiscal year 2011 and fiscal year 2012. Benefic data for this study were obtained only from the annual vocational rehabilitation program report for persons with significant disabilities cost data for this were obtained from the annual vocational rehabilitation program for persons with significant disabilities cost report.

In this methodology, the cost of vocational rehabilitation program for persons with significant disabilities was calculated by taking annual costs of total program and the cost of administration.

This study have illustrated the benefits that vocational rehabilitation program can provide for a comparatively nominal costs. Using cost-benefit analysis procedures, it is estimated that for every dollar spent on vocational rehabilitation program, \$2.14(2011), \$2.35(2012) are returned to society.

The result of this study, however, it cannot be assumed that all sectors of society directly benefit from these outcomes; rather, each benefit may affect one segment of society which in turn indirectly benefit other sectors. For example, increased earnings are a benefit for user who received vocational rehabilitation services, but do not directly benefit taxpayers. But, it lead to increased tax contributions among vocational rehabilitation program user, which is a benefit to taxpayers. Also, increases in earnings also stimulate the economy through increased consumer spending and purchasing of goods and services.

The vocational rehabilitation program is estimated to have a high economic value by providing employment opportunities to persons with significant disabilities in Korea as a public social program. An increase in employment opportunities of persons with significant disabilities also allows social inclusion of them and reduces other social service costs.

Keywords: Vocational Rehabilitation Program, Cost-Benefit, Persons With Significant Disabilities, Rehabilitation Administration, Rehabilitation Policy

Introduction

Vocational rehabilitation program for persons with significant disabilities is critical to the successful implementation of social policy and programs for the most vulnerable population in this nation. This program is designed to help participants succeed in jobs that enable them to live as independently as possible, reduce or eliminate their need for publicly funded benefits and be fully contributing members of their local communities. Also, the economics of vocational rehabilitation program studies had been conducted by many researchers (Wheman & Kregel, 1985; Thornton, C, 1992; Cimera, 2012) and in numerous countries, including Australia, Canada, Great Britain and USA (Jaeger, Berns, Douglas, Creech, Glick & Kane, 2006; Latimer, 2001; Shearn, Beyer, & Felce, 2001; Cimera, 2012).

Vocational rehabilitation programs for persons with significant disabilities have been assessed as the most effective program or social policy to inclusion them into society in the most valuable way. Researches have proved that the economic value of such programs is higher than any other social programs and many countries such as the USA, the UK, Canada, Australia, and Korea have been actively studying such matters.

Vocational rehabilitation support programs for persons with significant disabilities in Korea include vocational counseling, vocational evaluation, work adjustment training, job training, job development and placement, and post-employment services. The programs aim to support persons with significant disabilities to obtain jobs or provide them with job training courses in order that they may make a vocational living suited to their abilities and aptitudes through sheltered or competitive employment opportunities.

In Korea, the vocational rehabilitation programs for persons with disabilities are run by three different regulations and systems. First, an employer who employs not less than 50 full-time workers should employ persons with disabilities equivalent to more than 2.7% (private companies) or 3% (public organizations) of the total employees pursuant to the Act on Employment Promotion and Vocational Rehabilitation for Disabled Persons. The act is controlled by the Ministry of Employment and Labor and supported by inclusive supported employment.

Second, the Welfare of Disabled Persons Act provides persons with significant disabilities with vocational rehabilitation and sheltered employment opportunities. It is controlled by the Ministry of Health and Welfare, ensuring systemic vocational rehabilitation courses, inclusive employment, supported employment, and sheltered employment.

Third, transitional services are provided to students with disabilities in middle and high schools under the Act on Special Education for Disabled Persons. It is run by the Ministry of Education and offers vocational training and transitional services.

The unemployment rate of persons with disabilities in Korea was 5.9%, whereas that of persons without disabilities was 3.0%, as of May 2013. However, the unemployment rate of persons with significant disabilities was 10.8%, which was five times higher than that of persons without disabilities (Korea Employment Agency for the Disabled, 2013). Although there could be several reasons that caused the high unemployment rate, the primary causes were the lack of awareness for the basic labor rights of persons with disabilities and systemic approach to vocational rehabilitation.

Korea revised the Act on Employment Promotion and Vocational Rehabilitation for Disabled Persons in 2000, which includes the mandatory employment quota system, to increase employment opportunities for people with significant disabilities and offer systemic vocational rehabilitation programs. The revised act became effective in 2001.

The purpose of this study is to analyze the economic effect of the vocational rehabilitation support services that have been provided by the Ministry of Health and Welfare since 2001 to support the employment of persons with significant disabilities. The study aims to propose how to invest limited resources into the vocational rehabilitation programs to expand employment opportunities of people with significant disabilities.

Method

Many cost/benefit studies using similar strategies in estimating costs and benefits found low initial benefit-to-cost ratios for vocational rehabilitation program gradually increased over time (Zilovich, Shueman, & Weiner, 1997; Na, 2001; Byeon, Kim, Kang, & Yu, 2011). As with the Conley (1969) model, cost/benefit studies of vocational rehabilitation typically include costs such as overhead administrative and other program costs, which benefits include increased earnings, increased tax contribution, reductions in public assistance use and reductions in alternative program cost.

This cost/benefit analysis of vocational rehabilitation program for Koreans with disabilities is based generally on the models previously discussed.

Subjects

In order to study the effect of the vocational rehabilitation program, we used data on 12,381 individuals who had participated in Korea's vocational rehabilitation program for persons with significant disabilities and whose cases were closed with a successful employment outcome from 2011 to 2012.

The majority (36%) of the 12,381 users was described as moderately mentally retarded and approximately 70% of all users were described as significant. These users were most frequently employed in entry level, non-skilled position such as production or services. Also, the users were predominately males (63%), with an educational level beyond high school (50%).

The primary data used in estimating the cost and benefit of vocational rehabilitation program were obtained from report annually submitted by the Korea Disabled People’s Development Institute (KoDDI).

Table 1. Key user demographic Characteristics, 2011-2012 (N=Total 12,381, 2011=6,069, 2012=6,312).

Type of Disability – Mentally retarded 36% – Physically 23% – Blindness 13.3% – Mental disorder 5.6%	Functioning level – Significant 70% – Mild 30%
Gender – Male: 63% – Female: 37%	Educational level – High school 50% – Middle school 16% – Bacheor’s degree 12%

Analytic Procedures

The Pareto optimality condition of Kaldor (1939) and Hicks (1939) was used as an analysis model for this study. The Pareto optimality condition is a concept whereby if the input of resources such as human or physical resources is bigger than the output of resources, it justifies the allocations – as long as they raise net social welfare. The raised welfare by the input is considered social benefits while the reduced welfare by the output is considered costs. The benefits and costs are divided into tangible and intangible types or direct benefits (direct costs) and indirect benefits (indirect costs) by party concerned.

The vocational rehabilitation programs for persons with significant disabilities, which include vocational counseling, vocational evaluation, work adjustment training, job development and placement, and post-employment services, support additional factors such as human resources and equipment to the existing infrastructures for the disabled. Such factors promote remuneration sheltered employment of persons with significant disabilities through activities including vocational counseling, vocational evaluation, work adjustment training, supported employment, and post-employment services. Conducting such programs generates reallocations which create social benefits and costs.

The study analyzed two years’ worth of data from 2011 to 2012 and calculated yearly benefits and costs based on the Korean fiscal year. The criterion for economic efficiency used in this study is the ratio of costs and benefits of the

applicable year, calculated by the formula (1). In this study, the cost-benefit ratio means a benefit you can expect per \$1 you spent during the fiscal year, i.e., the reciprocal of the unit cost with respect to the benefit worth \$1.

$$\frac{B_t}{C_t} \quad (1)$$

C_t are the total costs and B_t are benefits during the period t . An absolute value of such ratio is meaningful: If, on the one hand, the value is bigger than 1, benefits are considered larger than costs (net benefits are bigger than 0), and thus it confirms the validity of the project in terms of economic efficiency as the reallocations of resources occurring through the execution of the project raise the net social welfare. On the other hand, if the value is smaller than 1, (net benefits are smaller than 0) the allocations reduce the social welfare thus the validity of the project is not found. Therefore, the higher the ratio, the higher economic the efficiency a project will show.

All the factors of costs and benefits were converted to market currency value. When applying the currency standard to data of a year or longer, a discount rate of consumer price inflation was used. Although it was different by year, the consumer price inflation rate was 4% in 2011 and 6.2% in 2012.

Benefits and Costs

Many variables were used to calculate costs and benefits for this study. First, salaries to be earned by persons with disabilities through the program, their levels of work competencies to be upgraded through the job training courses and work adjustment training, reduction of vocational evaluation costs were used to calculate direct benefits. Indirect benefits included the cost of alternative programs to be provided to them in the event that the vocational rehabilitation programs were not offered.

An annual salary of a worker with disabilities was used to calculate the tentative salaries while training expenses and work injury compensations were used to estimate the levels of improvement of their work competencies. The expenses which might have been incurred to take vocational evaluation at a private agency if they were not provided with the vocational rehabilitation programs were considered as the reduction of the job evaluation costs. Day care service costs were used to estimate the expenses of the alternative programs.

Table 2 illustrates the benefit of vocational rehabilitation program for users in closed successful employment outcome from 2011 to 2012.

Using the data of 2011 assuming 6,069 people with disabilities were employed, an average annual salary was estimated at \$26,180, the benefits earned through improving the work competencies were \$3,300, costs saved by not taking a private job evaluation were \$349, and costs saved by not taking an alternative

program were \$4,942; total benefits were estimated at \$34,771. Using the data of 2012, assuming 6,312 people with disabilities were employed, an annual salary was estimated at \$28,810, the benefits earned through improving the work competencies were \$3,985, costs saved by not taking a private job evaluation were \$356, and costs saved by not taking an alternative program were \$5,051; total benefits were estimated at \$38,202.

Table 2. Estimated Total Annual Benefit

Annual/ Category	gain in earning	increased job competence	reduction in vocational evaluation payments	reduction in day program	total annual benefit
2011	\$26,180	\$3,300	\$349	\$4,942	\$34,771
2012	\$28,810	\$3,985	\$356	\$5,051	\$38,202

The costs consisted of direct costs, including labor expenses, equipment and land use fees, program and operational costs incurred to run the program and indirect costs required to manage the program. In case of equipment consider depreciation. The standard depreciation was applied to the durability life.

The labor expenses included benefits provided to employees such as work insurances, bonus, and food expenses. All types of devices and tools purchased to run the program were considered as the equipment. The land use fee was excluded as there was limitation to calculate the land expenses realistically. All expenses incurred to run the program for a year, excluding the labor and equipment expenses were considered as program operational costs.

Expenses incurred to manage and support agencies that run the program were considered as the indirect expense.

Table 3 illustrates the costs of vocational rehabilitation program from 2011 to 2012. Total costs invested in the vocational rehabilitation program for persons with significant disabilities in 2011 were \$16,281, which included labor expenses of \$9,398, the cost of purchased service material of \$102, vocational rehabilitation service expenses of \$1,147 and indirect costs of \$5,634 incurred to manage and support the program. Total costs invested in the program in 2012 were \$16,281, which included labor expenses of \$8,500, the cost of purchased service material of \$102, and vocational rehabilitation service expenses of \$1,143 and indirect costs of \$6,536.

Table 3. Estimated Total Annual Cost

Annual/ Category	personnel expenses	cost of pur- chased servi- ce material	cost of services	non-operation expenses	total annual cost
2011	\$9,398	\$102	\$1,147	\$5,634	\$16,281
2012	\$8,500	\$102	\$1,143	\$6,536	\$16,281

Analysis result

Cost-benefit analysis has traditionally used three measures of efficiency for analyzing the present values of a program's costs and benefit: net present, internal rate of return, and benefit-cost ratio. The net present value of a program refers to the difference resulting from its costs minus its benefit. The internal rate of return of a program refers to the discount rate at which the program's benefit equal its costs. The benefit-cost ratio of a program is simply the ratio of benefits to costs. When monetary values for benefits are not available, a cost-effectiveness ratio can be developed between the cost of a program and its outcome. Thus, this study uses the benefit-cost ratio method in order to arrive at an estimate of benefits per dollar invested.

Table 4 illustrates benefit analysis of Korea's vocational rehabilitation support program based on the average costs and benefit estimated from FY 2011 to FY 2012 data.

The economic value of the program when investing a dollar turned out to be \$2.14 in 2011 and \$2.35 in 2012; it is indicative that the program is meaningful as a social policy. As this study limited the period of benefits to a year and did not apply the reduction of social security expenses that the net benefits are expected to be higher in reality.

Table 4. Cost/Benefit Analysis of Korea's Vocational Rehabilitation Support Program, FY 2011, 2012

Annual/Category	Present Value of Benefit(B)	Present Value of Cost(C)	Present Value of Net Benefit(B-C)	Benefit-Cost Ratio (B/C)
2011	\$34,771	\$16,281	\$18,490	2.14
2012	\$38,202	\$16,281	\$21,921	2.35

Discussion

This study have illustrated the benefits that vocational rehabilitation program can provide for a comparatively nominal costs. Using cost-benefit analysis procedures, it is estimated that for every dollar spent on vocational rehabilitation program, \$2.14(2011), \$2.35(2012) are returned to society.

The result of this study, however, it cannot be assumed that all sectors of society directly benefit from these outcomes; rather, each benefit may affect one segment of society which in turn indirectly benefit other sectors. For example, increased earnings are a benefit for user who received vocational rehabilitation services, but do not directly benefit taxpayers. But, it lead to increased tax contributions among vocational rehabilitation program user, which is a benefit

to taxpayers. Also, increases in earnings also stimulate the economy through increased consumer spending and purchasing of goods and services.

The vocational rehabilitation program is estimated to have a high economic value by providing employment opportunities to persons with significant disabilities in Korea as a public social program. An increase in employment opportunities of persons with significant disabilities also allows social integration of them and reduces other social service costs.

However, there are several limitations to applying this study to reality. Firstly, factors affecting the outcome of the vocational rehabilitation program such as costs and benefits are hard to estimate; the value of the program could not be measured accurately. Second, the benefits of the program cannot be estimated only by the results such as employment effects and incomes earned. Lastly, the benefits of vocational rehabilitation programs need to be observed for a long time; the limited period of a year resulted in differences in value of the benefit estimated in this study with that of other studies such as \$16 of a study by Hemenway & Rohani in 1999, \$5.75 of a study by West Virginia in 2011 or higher economic values claimed by other studies by Kenyon, Koshy and Wills-Johnson in 2005 and Wilhelm & Robinson in 2010.

Notwithstanding the limitations of this study, the vocational rehabilitation support program for persons with significant disabilities in Korea was estimated to have an economic value, effects on their social integration, and reduction of other rehabilitation service costs.

Therefore, the Korean government needs to approach rehabilitation services for persons with significant disabilities, focusing on such programs and provide stronger support so that they can naturally be included into and make contributions to society.

Notes

1This paper is the revised manuscript of 2014 RI European International Conference.