

AN ANALYSIS OF THE COST-EFFECTIVENESS
OF SELECTED GOVERNMENT-SUPPORTED TRAINING PROGRAMS/

by

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I. INTRODUCTION.

Overview

Economists have long recognized that structural forces may cause underutilization of human capital. Classical economists emphasized wage rigidities and short-term supply barriers, for example, as causes of unemployment. Labor markets, they argued, would gravitate toward full employment equilibrium if all such rigidities and interferences were absent.

The argument continues that if wages were flexible and the number of workers seeking employment at a given wage level exceeded the number of jobs available, wages would tend to fall. Conversely, if quantity demanded was greater than the number of workers willing to work at the prevailing wage levels, wages would rise.

Neoclassical economists make the same observations, but point to minimum wage laws, union restrictions, geographical immobility of labor and other market imperfections as causes of unemployment. They go beyond these basic causes however, and consider other imperfections commonly found in labor markets. Of special interest in this thesis are the costs of information and training-related external economies.

Information on the availability and character of jobs and job seekers is viewed as a normal good (positive income elasticity and a downward sloping demand curve) with

significant opportunity cost. To acquire information one must expend resources. As a consequence, the equilibrium of supply and demand will be conditioned by transactions (information) costs.

Another imperfection in labor markets is related to externalities. Here, human capital development is viewed as a product of explicit investment. A unique characteristic of this investment, however, is the potential that training generates external benefits. Specifically, employers who incur training-related expenditures--via explicit instruction or on-the-job training (OJT)--have no property rights to their investment. Therefore, there is an implicit risk in making such investments because the benefits of training could be conferred on noninvestors.

In certain situations, information costs and training-related externalities may lead to under-investment in human capital, i.e., a non-Pareto equilibrium in which marginal social return to human capital investment exceeds its marginal social cost. When this situation occurs, it may be economically sound to have the public sector make some selected human capital investments.

Problem Statement

This thesis examines the cost-effectiveness of two specific government-funded training program interventions in the context of these neoclassical perspectives: State

Customized Training (SCT) and the job-training sections of the Comprehensive Employment and Training Act (CETA).

These two programs were selected because they represent extremes in philosophies regarding how to achieve the same job placement objective. SCT is characterized by an agreement between participating firms and SCT authorities to fill actual or perspective vacancies with the trainees. Utilizing this agreement has had the effect of focusing the orientation of both employer and employee to specific employment and turnover rate considerations. CETA programs, in contrast to SCT, do not have employment and training agreements as a matter of explicit program design.

Another important reason for selecting these two programs is that they are the two most significant publicly funded training programs. CETA and its' successor, the Jobs Training Partnership Act (JTPA) of 1982, is a model program that is currently receiving federal funding, and SCT is a state program that appears to be increasingly important.

II. THEORETICAL CONSIDERATIONS

The theoretical considerations under review are presented by first providing a treatment of human capital and investment to examine the theoretical case for market failure and intervention. This section is followed by a brief historical review of vocational education, CETA, and SCT to provide the background for an analysis of data in Section IV. Vocational education is reviewed because it also represents a primary organizational structure on the state level for the delivery (within separate units) of SCT programs.

Human Capital and Investment

It is generally acknowledged that skilled workers have higher marginal productivity rates than non-skilled workers in the production of goods and services. The skills and knowledge of these workers represent a form of capital, and this capital is, in substantial part, a product of deliberate investment. Economists have long agreed that people are an important part of the wealth of nations and that the productive capacity of human beings was vastly larger than all other forms of wealth taken together.

Many economists proceed very timidly when dealing with the concept of investment in people. According to T. W. Schultz (1), the notion of labor was wrong in the classical period, and it is patently wrong today. Laborers are

capitalists, not from a diffusion of the ownership of corporation stock, but from the acquisition of knowledge and skill that has economic value. All expenditures to acquire or improve knowledge, thus, should be termed as investments, in short, human capital investment.

Return on Investment

A number of economists have tried to estimate the rate of return on investments in human capital, particularly to investments in education and training. Becker (2) estimated the rate of return to be 10 to 12 percent per annum on college education.

Mincer (3) also arrived at a similar figure but argued that the difference in earnings was a weighted average of returns to "schooling and other investments in human capital" and not to education alone. Denison (4), using national income data, concluded that the share in economic growth attributable to education has been growing at an annual rate of 0.5% between 1943 and 1973 and at 0.9% between 1973 and 1976, even when the overall growth rate of the economy was declining.

According to Mincer (5), the rate of return on selected investment in on-the-job training was not different from the rate of return on total costs of college education, both unadjusted for ability factors.

General vs. Specific Human Capital

The return to investment in education and training is dependent on the type of training, i.e., on the degree of specificity or generality. Becker (6) analyzed the phenomenon by creating a dichotomy of general and specific training which is defined as the following:

1. General training is useful in many firms besides those providing it; for example, a machinist trained in the army finds his skills of value in steel and aircraft firms, and
2. Training that increases productivity of workers more in firms providing it will be called specific training. Although it is difficult to identify completely specific training, IBM training computer mechanics would come fairly close to specific training.

Becker further states:

Income maximizing firms in competitive labor markets would not pay the cost of general training and would pay trained persons the market wage. If, however, training costs were paid, many persons would seek training, few would quit during the training period, and labor costs would be high. . . . Firms that paid both the training and less than market wage for trained persons would have the worst of both worlds, for they would attract too many trainees and too few trained persons.

CETA is essentially a general training program while SCT may have more specific content. This is because of the close communication between SCT officials and employers in the structuring of training program content.

Training-Induced External Economies

In a competitive market, therefore, firms that train workers may impart external economies to other firms because

the latter can use these workers without incurring any training costs. The firms providing the training suffer a capital loss whenever, on net, trained workers are bid away by other firms.

In contrast, the property rights of firms that invest in research to develop a new product or process may be protected by patents. However, property rights in skills are automatically vested in the workers in our society. This is the source of incentive for the workers to invest in training via a reduced wage during the training period or to accept restrictive employment agreements.

Specific training, on the other hand, increases the marginal productivity of trainees to the firms providing the training more than to any other firm, thereby increasing the incentive for the firm to make the investment. According to Marshall (7):

If all training were completely specific, the wage that an employee could get elsewhere would be independent of the amount of training he had received. However, much of the training is neither completely specific nor completely general but increases productivity more in the firms providing it, and falls within the definition of specific training. As such, some training cost in specific training is shifted to the workers and the rest is borne by the companies. Thus, firms no longer pay all training costs nor do they collect all the returns, but they shared both with employees. The share of each depends on the relations between the labor turnover and wage rates, layoffs and profits, and other factors such as cost of funds, attitudes towards risks, and desires for liquidity.

While discussing the relative costs and benefits of specific training, Becker noted some of the implications of his analysis as the following (8):

1. Firms are more concerned about the turnover of employees with specific training than those with general training because the cost of specific training is borne mostly by the employers. A premium is often offered to reduce their turnover.
2. Employees with specific training have less incentive to quit, and firms have less incentive to fire them than employees with no training or general training. Even at recessionary times, specifically trained workers are less likely to be laid off as a consequence of a decline in demand than untrained or generally trained workers.
3. A worker collecting some of the returns from specific training would have less incentive to find a new job when temporarily laid off than others would: he does not want to lose his investment.

Becker's comment in item one (1) above where he stated that the cost of specific training is borne mostly by the employers represents more of an empirical statement and not one based on the definition of specific training.

Similar results were also reported by Walter Oi (9) who related the severity of cyclical changes (1929-33) in employment to levels of wages in a particular industry. He found an inverse correlation between the two. He also correlated average wages with turnover rates in a number of industries. Oi interpreted his results to support the hypothesis that the marginal product of specifically trained workers exceeded their wage, but the latter were higher than in alternative employment.

The concept of specific vs. general training, as put forth above, may not be as useful in today's labor markets. It is difficult to identify training which is so specific as to not have some generalizability. This is particularly the case when externalities are viewed on an industry-wide basis. It would appear that the broader the market, the more apt skills are to be generalizable. However, this section still provides useful background material.

Information

Information availability and related costs represent an important element in labor market theory. It is a central element in the neoclassical or orthodox theory of labor markets. The neoclassical theory, according to Levitan, Mangum, and Marshall (10), is the most widely accepted theory of labor markets. They assert that:

The formulation assumes perfect competition, although it can be used to examine less-than-perfect competition. In a perfectly competitive labor market the following factors describe the supply side: (1) workers have perfect knowledge of the market, including information on wage rate and available opportunities; (2) workers are rational and respond to differences in rates of return, including wages and noncash benefits; (3) workers are perfectly mobile; and (4) workers are not organized and make their own decisions on accepting jobs and wages offered.

On the demand side, perfect competition requires: (1) full and perfect knowledge of the labor market by employers; (2) that employers are rational and attempt to maximize profits; (3) that no employer represents a large enough part of the total demand for labor to affect wages; and (4) that employers act individually, and not in concert, in determining wages.

The competitive assumption is important to the neoclassical model because in the labor market, competition requires potential and actual labor mobility. This potential and actual labor mobility, in turn, is conditioned by the fact that the cost of information and transfer are positive.

According to Spencer (11), the underlying cause of real-world unemployment is the fact that job information and relocation costs are, in fact, positive. His analysis depicts a hypothetical world of zero unemployment in order to show a contrast with the actual world in which some unemployment inevitably exists. This zero-unemployment illustration is extremely useful in demonstrating that both frictional and structural unemployment are related in large part to institutional factors.

Specifically, the Spencer illustration depicts a situation in which everyone who wants a job at existing wage rates has one. The illustration assumes: 1) prices and nominal wage changes are correctly anticipated, 2) all labor is homogeneous, and 3) there are no market imperfections.

Frictional unemployment, according to Spencer, is characterized by the continual churning of jobs and workers through migration, etc. Structural unemployment, on the other hand, is related to shifts in relative demands for and supplies of labor as reflected in wages. These shifts in relative demand change due to technological advances,

changes in taste, or depletion of a natural resource. Relative supplies may change with shifts in particular categories of workers, minimum wage increases, and changes in the ability of some groups to alter the supply of labor in particular fields.

Spencer explains that legislative and allocative fiscal actions can best be used to lower the normal rate of unemployment, and monetary action can foster a stable climate for prices consistent with a prevailing normal rate of unemployment. Allocative fiscal policies oriented toward lowering the normal rate of unemployment include lowering the costs of information on a statewide basis (the concept would also hold for nationwide or citywide bases). The utilization of job information systems combined with training outlays directly related to the information is a major application of information-cost theory.

Information systems such as those referred to by Spencer are utilized by a limited number of states. For example, Braden (12) developed an information system in Oklahoma called the Occupational Training Information System (OTIS) which combines information and training outlay decisions. This system, which has been in full operation since 1968, is based on data collection and dissemination by public-sector institutions of data provided directly from firms. It is this direct contact that assists in

establishing the communication network, which in turn, reduces information costs.

On the demand-side, a program such as SCT, which is characterized by an agreement with participating firms to hire trainees, has two advantages relative to CETA programs: 1) the firms know their own labor requirements and can communicate them to the program manager, and 2) the firms select workers from among the trainees instead of having to accept those assigned to them. A program structured this way tends to reduce externalities (search cost borne by employers) and to shift the demand curve for labor outward. The firm sees reduced information costs because 1) workers are identified and recruited by the SCT program, and 2) there is no mismatch between the supply of workers and job demand. With reduced labor market information costs and the publicly funded training, firms would demand more labor at any wage rate.

From the supply-side and from the perspective of the worker trained by SCT, one would expect a reduction in job search costs since the jobs are already specifically identified. Training for specific jobs would have a tendency to reduce total training costs, since the likelihood is reduced of retraining due to the unemployment of the trainee. Also, there may be more incentive for trainees to learn the job training material since they know

that the specific jobs are available after the training completion.

Summary

Economists have long recognized that structural forces may cause underutilization of human capital. Classical economists emphasized wage rigidities and short-term supply barriers, for example, as causes of unemployment. Neoclassical economists make the same observations, but point to minimum wage laws, union restrictions, geographical immobility of labor and other market imperfections as causes of unemployment.

Neoclassical economists go beyond these basic causes however, and consider other imperfections commonly found in labor markets, e.g., the costs of information and training-related external economies. Briefly, to acquire information one must expend resources, and training generates external benefits.

This thesis examines two specific government-funded training program interventions in the context of these neoclassical perspectives: State Customized Training (SCT) and the training related portions of the Comprehensive Training and Development Act (CETA). The purpose of this thesis is to assess the comparative cost-effectiveness of the two publicly-funded programs: those with training and employment agreements as characterized by SCT and those without training and employment agreements as characterized

by CETA. In particular, given that the government intends to make an expenditure on this class of training, the thesis attempts to assess which type of program is more cost-effective.

From the demand-side, a program such as SCT with its' employment and training agreement, appears to have two advantages over CETA, i.e., that firms know their own demand for labor and that firms are able to make the final selection of workers from among the trainees. A program structured with this orientation tends to reduce externalities and to shift the demand curve for labor outward.

From the supply-side, SCT appears to provide a reduction in job search costs, a reduction in total training costs due to decreased retraining, and more incentive for trainees to learn job-related material since they know that specific jobs are available upon program completion.

III. COMPARING TRAINING DELIVERY SYSTEMS

Development of Vocational Education

Vocational education in the United States provides the foundation for CETA and SCT programs. Although vocational education in the form of apprenticeship had existed for centuries, first in Europe and later in the United States, its recognition as an alternative to formal academic education in this country did not come about until the passage of the Morrill Act in 1862. This Act was concerned with bringing the applied sciences taught at the universities to the rural and urban centers of America.

The first enunciated public policy in support of vocational education at the secondary school level came with the passage of the Smith-Hughes Act in 1917. This Act has been amended several times to enlarge its scope, to increase support, and to encompass more occupations and educational programs. It is interesting to note that as early as 1907 the National Society for Promotion of Industrial Education advocated that vocational education programs should be "open to all; sex, creed, color, nationality should not debar anyone", a theme which has been reemphasized through various amendments to the Act (13).

The Vocational Education Act of 1963, is generally considered a landmark. The purpose of the Act was to authorize Federal grants to states to assist them to maintain, extend, and improve existing programs of vocational education, to develop new programs of vocational education, and to provide part-time employment to trainees to continue their vocational training on a full-time basis (14).

In 1973, amendments to the Vocational Education Act were passed that further strengthened the requirement that training expenditures be targeted toward actual and potential labor market demand. The law also required verification of this demand.

In general, the Act was flexible and provided vocational education with a potential for meeting the training needs of those who could benefit from such training. The only limitation seemed to be the perception of such needs by the leaders of vocational education and their community leaders and the ability to link the programs with the private sector where 75% of the jobs were to be found. New Amendments to the Vocational Education Act are now under consideration in the Congress to further emphasize the need for private sector participation in planning and implementing these programs.

Comprehensive Employment and Training Act (CETA)

The Comprehensive Employment and Training Act (CETA) was enacted into law on December 28, 1973 in order to assist state and local governments and other organizations to provide comprehensive programs of employment, training, and supportive services to unemployed, underemployed and economically disadvantaged individuals. This law consolidated activities under the previous law which had been carried out through 12,000 separate contracts, and delegated the planning and operation of these programs to governors and local officials in jurisdictions of 100,000 population or greater (prime sponsors).

CETA programs initially focused on training activities with only a small public service jobs program. However, the public service jobs portion (not analyzed in this thesis) of CETA continued to grow to an enrollment level of 735,000 in 1978, over-shadowing the level of funding of the other titles.

The portion of CETA that is analyzed in this thesis is the Comprehensive Training Programs or Title II-B, C. According to the Congressional Budget Office (15), CETA provided forty percent of its funding for comprehensive training programs. The remaining funding was provided through three categorical programs, i.e., special federal responsibilities (Title III) that authorized the Secretary of Labor to carry out programs for special target groups

(Indians, Migrants, etc.); youth programs (Title IV) that authorized various youth programs (Summer Youth, Job Corps, Youth Employment and Training, etc.); and private sector opportunities (Title VII) that authorized funding for any special projects which might appear to have merit (preventing school dropouts, etc.). Title VII is not designed to fund any one type of private sector program and is therefore not similar to SCT in funding source or program design.

Since this thesis is concerned with comparing SCT with CETA's comprehensive training title (Title II-B,C), the remaining material will be limited to a further description of this program. The three main types of training within the comprehensive training title were: classroom, on-the-job, and work experience. These programs offered basic educational training, specific occupational training, general exposure to work, and job search assistance.

The classroom training provided occupational skill and basic educational training in an institutional setting. The occupational training provided skills for specific occupational categories such as clerical workers. On-the-job training provided specific occupational skills in actual job settings while work experience focused more heavily on providing subsidized employment to instill basic work habits and attitudes rather than just teach specific skills.

The data utilized in this thesis focused on low-income woman 24 years of age and older because these data presented CETA in the best light of all the categories of data that were available. These data were taken from participants in all of CETA's comprehensive training title II-B, C training programs, i.e., classroom, on-the-job, and work experience. Although two of these programs required some contact with employers, there were no pre-training employment agreements. Similarly, some implicit contract might have existed for the on-the-job training program but no data were found to make a determination.

According to the Congressional Budget Office (16), Forty-seven percent of the women analyzed in this thesis were enrolled in classroom training that took place in institutional settings that were designed primarily to provide specific occupational skills such as typing and keypunching. Thirteen percent of the women were enrolled in on-the-job training with CETA partially subsidizing their wages, while the remaining forty percent were enrolled in work experience which focused heavily on providing subsidized employment to instill basic work habits and attitudes rather than just teach specific job skills.

The effects of classroom training, on-the-job training, and work experience were roughly the same for each of the three categories in terms of costs, benefits, and training duration which was approximately 20 weeks. The number of

actual hours devoted to training and the impact of the training on worker's alternatives or income foregone were not available. The placement rate for CETA programs averaged 66 and 65 percent in 1980 and 1981, respectively (17).

CETA was replaced in 1982 with the Jobs Training Partnership Act (JPTA). This Act attempts to move toward the training aspects of CETA (Title II-B,C which is under study in this thesis) and away from the job creation or non-training titles of CETA. An unpublished proposal for the reform of the nation's employment and training system (18) provided the following analysis of CETA's shortcomings:

1. A multiplicity of program goals and target groups to be served leading to an emphasis on considerations such as eligibility determination.
2. Limited private-sector involvement which has led to the perception that training and employment services do not relate directly to the needs of employers and do not adequately prepare participants for regular unsubsidized jobs. As a result, many CETA programs obtain only limited access to job openings in the private sector for their program participants.
3. Excessive administrative complexity imposed by the CETA legislation and by Federal requirements.
4. Insufficient attention to program performance outcomes, particularly long-term job attachment of participants in unsubsidized employment in private-sector jobs.

Similar insight was provided by the National Alliance of Business (19) when they stated:

... A growing body of opinion sees the lack of responsiveness to the business sector as a major failing of existing (Federal) employment and training programs....The underlying goal of all of these Federal programs was presumably to prepare the disadvantaged to compete effectively in the mainstream economy....But in local program operations business employers were rarely consulted about the number and type of jobs likely to open up; the specific skills needed for such jobs; or how to design training programs to best meet the needs of local employers and industries. For the most part, private employers were considered important only at the end of the process, when the issue became job placement.

State Customized Training Programs (SCT)

In its simplest form, SCT is firm-specific training provided to workers at little or no cost to either the firm or the trainee. SCT is offered in all Southern and many other states that total thirty-six.

In the South, where SCT started during the late 1950's, the practice is credited with being an integral element of the state industrial development process. In a recently published study by Paul and Carlos (20), it was found that the SCT programs are funded almost exclusively from state and local sources. On the other hand, Paul and Carlos state that some critics consider SCT as a subsidy to industries and a wasteful use of public funds.

According to a recent study by the Council for Urban Economic Development (CUED) (21) concerned with state industrial incentives, there are several elements which are

common to the most successful SCT programs. One feature is the freedom and flexibility given to the state's program representative to negotiate with firms on their training needs. A second feature is the complete support of the governor and coordination with the efforts of the states business development program.

According to Ledebur (22), after the initial contact by the company, the state requests general information that enable it to judge if a training program is possible and, if so, what type of training is indicated. States usually request the following information from companies:

1. the number of job openings that will occur,
2. job descriptions and performance standards for each employee,
3. the date that production will start,
4. the salary rate of each employee, and
5. whether the company plans to phase in its workforce or to expand its workforce in the future.

Based on the above demand-oriented information, SCT and firm representatives design and commit to a pre-training employment agreement. According to the Department of Education study (23), these agreements with businesses were binding memoranda of agreement to carry out training aimed at filling specific jobs for specific firms.

As cited earlier, the CETA programs do not have these pre-training employment agreements. The programs without training agreements tend to concentrate on preparing

trainees for employment without knowing the specific details of what a specific employer desires or does not desire in his or her workforce. From a cost standpoint, this puts the CETA program at a disadvantage in program design and evaluation, and trainee placement. According to the same study, placement rates for SCT programs were over ninety percent.

In 1982, a study was completed by the U. S. Department of Education which requested that each state with an SCT program provide a program description. Fewer than thirty-six states responded because the survey was only aimed at those SCT programs operated by vocational education departments. In all cases, direct contact with firms was stressed. An example from the U. S. Department of Education study (24) follows that describes these programs.

In Indiana, there is a state coordinator of training and economic development programs who is on the staff of the state board of vocational-technical education. This person coordinates the work of five work analysis specialists and five contract specialists. These specialists make inventories (performance-oriented task analyses) to determine the training needs of employees. The coordinator works with other educational agencies and with the industry itself to identify the resources needed. A budget is developed, utilizing various methods of funding. Then the schools and institutions in the State that are capable of delivering the training are identified.

The only exceptions to the above description for Indiana would be that some states operate more elaborate programs with separate training units and large equipment inventories. One reasonably common program characteristic

is the offering of programs at night so that those who are presently employed might continue their work. No stipends or living allowance was mentioned for either SCT or CETA.

Comparing CETA and SCT

Data on selected variables is listed below in an attempt to compare CETA and SCT populations.

<u>Variable</u>	<u>CETA</u>	<u>SCT</u>
1. Pre-Training Employment Agreement	No	Yes
2. Program Objective is to Train for Gainful Employment	Yes	Yes
3. Program Trains for Semi-skilled-and-Below Jobs	Yes	Yes
4. Modal Training Time	Day	Night
5. Average Age	35	Unknown
6. Mimimum Age	25	Unknown
7. Percent Minority	44	Unknown
8. Average Years of School	11.3	Unknown
9. Average Number Weeks in Training	20	4-26
10. Publicly Funded	Yes	Yes
11. Employment Status During Training	Unknown	Unknown
12. Stipends or Living Allowance	No	No
13. Percent Placement After Training	66	90
14. Percent Unemployed Prior to Training	30	15-33
15. Percent Previously Employed for at Least Part of Year Before Training	88	Unknown

This comparison is utilized in the Analysis Section to formulate a methodology to examine the relative benefit-cost of the two types of training programs. The critical variable may be the training agreement, i.e., SCT has the agreement and CETA does not. Both programs are publicly funded, train for semi-skilled job levels and below, provide training for workers that either have a high average age or are known to attract workers sufficiently motivated to undergo training without any training allowance, and have a clear training program objective to prepare trainees for gainful employment.

One possible difference between SCT and CETA might be financial support that SCT programs receives from private sector firms or other sources other than what was reported. However, this is not likely since the survey of state SCT program directors specifically requested all cost data. However, due to the close cooperation between the SCT and firms, it is possible that some indirect contributions were made that reduced program costs to the state. However, no direct evidence of this could be found.

IV. ANALYSIS

Introduction

The purpose of this thesis is to assess the comparative cost-effectiveness of two general types of publicly supported training programs: those with training and employment agreements as characterized by State Customized Training (SCT) and those without training and employment agreements as characterized by Comprehensive Employment and Training Act (CETA) programs, respectively. In particular, given that the government intends to make an expenditure on this class of training, the thesis attempts to assess which type of program is more cost-effective.

General Methodology

Training and Employment Agreements

The methodology is designed to compare training programs which have training and employment agreements with firms and those that do not. For the purpose of this thesis, training programs based on training and employment agreements are taken to be those programs that utilize specific job vacancy data derived from new or expanding firms for program planning. The training programs are funded only when there is a high probability that the majority of the trainees will be hired upon program completion. Although the training and employment

agreements do not guarantee every trainee employment, the placement rates run well over 90 percent.

Information about the job vacancies is collected before training is funded. Additional data on job descriptions, production schedules, wage rates, and anticipated hiring dates are also considered critical. All of the above information is put into a training agreement between SCT and firm officials.

In contrast, training programs without training and employment agreements are taken to be those programs that concentrate on preparing trainees for employment in a more general sense. That is, although the programs may provide training for specific occupational categories, there is generally no agreement for the trainees to fill specific job vacancies for specific firms upon program completion.

Non-agreement programs often concentrate on considerations such as worker attitudes, high school completion units, punctuality, and basic literacy skills. Emphasis on specific employment opportunities begins in earnest after graduation rather than before the training is initiated.

Populations

Two training program styles characterize an agreement and non-agreement orientation, i.e., SCT and CETA, respectively. SCT programs are not funded until specific job vacancy data are collected and an agreement reached and

that program graduates who meet specific hiring criterion will be hired.

In contrast, notwithstanding the fact that the objective of Title II of the Comprehensive Employment and Training Act is to secure and maintain employment and increase the enrollees' earnings based on a comprehensive system of labor market information, evaluations of CETA programs make it clear that training and employment agreements with private sector employers are not common practice.

Analytic Technique

The analytic technique utilized in this study is cost-effectiveness analysis. Cost-effectiveness measures whether a particular intervention is justified by a ratio of benefits to costs. If a ratio is greater than one the particular form of intervention is cost-effective. An appropriate use of cost-effectiveness analysis is to compare alternative forms of publicly funded programs and rank them from most to least cost-effective. This is the approach to be used in this thesis for comparing the two approaches to publicly funded training programs.

Cost-effectiveness ratios, then, are the discounted present value of the time stream of the benefits of an intervention or program over the discounted present value of the time stream of costs. A complete cost-effectiveness analysis rests upon:

1. enumeration of all costs and benefits of project or intervention;
2. evaluation of all costs and benefits in dollar terms; and
3. discounting of all future costs and benefits.

The enumeration of costs and benefits involves both direct and indirect aspects. Direct benefits are those increases in output or productivity attributable to the purpose of the program. The direct benefit, in this case, is the net increase in output as measured by the net increase in income of the training program graduate. The indirect or "spill-over" benefits would be the benefits accruing to individuals or organizations not directly associated with the purpose of the program, i.e., externalities.

To have a complete specification of the model, the enumeration of program costs should reflect foregone alternatives. Listing direct resource costs gives only a partial account of real costs. In addition, all external costs (externalities or those costs not reflected through the price system) should be included. Thus, if a new training program in a given area will have the effect of attracting persons from nearby employment areas, the corresponding reduction in firm output should be included as a cost of the program. This is accomplished here by counting only the increase in income; the income prior to

the training is a measure of the goods that would have been produced had training not taken place.

The measure of externalities (it may be that none exist) and opportunity costs is beyond the scope of this study because of the lack of adequate empirical data. Clearly, the absence of data on externalities and foregone income during training must be recognized as a limitation of the study and is so indicated in the limitations section to follow.

An argument can be made that the lack of data on foregone income is not restrictive. This lack of data is not restrictive since 1) the Office of Education study (25) cites that SCT training is often offered during the evenings in order that underemployed persons might participate while continuing to hold their present jobs, 2) both SCT and CETA had many trainees who came from the ranks of the unemployed and 3) because SCT was later shown to have orders-of-magnitude higher benefit/cost ratios than did CETA, and error in the calculation of externalities or foregone income would no doubt be in favor of SCT. Thus, cost-benefit analysis, with due recognition of the limitations, was employed appropriately in this thesis to rank choices but not to tell whether they are in net cost-effective.

Application of cost-effectiveness methodology to training ideally employs assessment from three perspectives,

viz., the trainee, the firm, and the state. However, an analysis of the cost-effectiveness for the firm and the state is beyond the scope of this thesis. Rather, a combined, direct approach is used. Benefits focus on the differential wages accruing to training because these measure the increase in output due to the training and costs refer to expenditures made by the trainee and the government combined. In particular:

Trainee

Costs = present value of all costs incurred by or for the trainee, including expenses, travel, tuition and supplies.

Benefits = present value of differential of time stream of income with and without training.

This methodological framework structures the analysis as would be undertaken in the absence of any data costs and other constraints. The full array of data are not available. It is necessary, therefore, to detail several limitations of the thesis.

Limitations of the Study

1. Data analysis is limited to the worker (person receiving the training), with inclusion of all public expenditures. However, the analysis does not include the opportunity costs of foregone income. To the extent that CETA and SCT populations have relatively similar backgrounds and employment experience, the failure to adjust training costs for foregone income during training should not introduce significant bias into the comparison of CETA and SCT benefit/cost ratios.
2. Data collected during the time frame investigated might be substantially different from the data collected to represent a different period of time.
3. SCT might recruit substantially different persons for training than CETA programs. Although both populations had high numbers from the ranks of the unemployed, it is possible that creaming took place, i.e., only the most qualified candidates for SCT training were selected. There is no evidence to determine if this took place.
4. The goals of SCT and CETA training programs might be substantially different although both list training for employment as prime objectives and both were

characterized by a large percentage of their enrollment coming from the ranks of the unemployed.

5. The proper use of benefit/cost analysis is to compare the cost-effectiveness of one program with another rather than state that one is cost-effective and the other is not. This is the case because the model can seldom, if ever, be fully specified and uncertainty is always present.
6. Scale effects or differences in relative factor prices may preclude generalization of results. Consequently, the dominant program based on cost-effectiveness criteria may not be the program of choice if these conditions are different.
7. The data utilized in the study are time-limited. The CETA population was followed for three years and the SCT populations for one year. Further, each survey was for a different period of time. There is no way a single point estimate can be utilized to make relative comparisons for all ranges of output and for all input combinations.
8. Age distribution data were not available for SCT and CETA trainees. Therefore, the data were not adjusted for any age distribution. However, the literature indicates that SCT trainees tend to be mature and the CETA trainees studied were all twenty-five years of age or older (26). Therefore,

the construction of work-life scenarios were designed to begin at age twenty-five.

9. Data on SCT program costs were provided by the respective state directors and contain all costs including any expenditures by firms, e.g., instructional equipment. To the extent that any of these expenditures were not reported, SCT program costs would be understated.

Specific Methodology

Estimates of the effects of CETA training on earnings of trainees and a control group of nontrainees have been developed from the Continuous Longitudinal Survey by the Congressional Budget Office and the National Commission on Unemployment Policy (27).

The CETA data represent 1975-76 trainees who were followed for three years and SCT data represent 1980-81 trainees who were followed for one year after training. Both sets of data were expressed in 1980 dollars. Using data from two different time periods is justified on the basis that there appear to be no significant differences in CETA and SCT participants between 1975-76 and 1980 (28). In addition, the available data did not indicate any significant difference in the average number of weeks in training.

The income differentials were assumed to remain constant over the working life of the trainee. Time streams

of income differentials were discounted to a present value to determine the benefits of training to the trainee. These present value estimates were used as an approximation of benefits derived from each type of training, i.e., SCT and CETA.

These benefits were then compared with the low, average, and high program costs levels since the trainees could have experienced any of the three program cost levels.

The analysis of differential placement rates between SCT and CETA was limited to a straight-forward presentation of the placement rates found in the available data.

Analysis of Data

Using the proposed methodology, data, and data approximations, it was possible to assess the comparative cost-effectiveness of two alternative types of public-sector training.

In addition, if we were to assume that the trainee paid the full cost of training and if opportunity costs of alternative programs were known, it would also be possible to address the issue of whether investment in training by the worker would be cost-effective. If the ratio of benefits over costs were more than one, the training would be cost-effective. This would imply that there would be an incentive for the worker to invest in the training if information costs and uncertainty were eliminated.

Data Sources

The analysis draws on the three primary data sources:

1. The Congressional Budget Office and the National Commission on Unemployment which provides the CETA data.
2. A Survey of SCT by the Urban Institute.
3. A follow-up telephone survey by the writer in conjunction with the Urban Institute to obtain data on placement rates, program duration, and pre- and post-wages. The telephone interviews were with SCT Directors.

A. Analysis of SCT

1. Annual Benefits from Training

The first step was to examine the average annual benefit level for SCT. Benefit data for SCT were not immediately available from any source including the Urban Institute of Washington, D.C. necessitating a telephone survey of a sample of SCT Directors. This survey was conducted in conjunction with the Urban Institute. Specifically, the writer conducted the telephone interviews after fully reviewing the methodology and results with the principal investigator of the Urban Institute study.

Twelve states were randomly drawn from the thirty-six states which responded to the original Urban Institute survey on SCT (see Appendix A for states, number of trainees and total program costs). Pre- and post-wage data were

requested for the graduates of the 1979-80 training programs. The state directors provided data on the low (the mode of the lower one-third wages), overall average (mode), and high average (the mode of the higher one-third wages) pre- and post-training wages for those years. Table 1 shows hourly wage data by the twelve-state sample.

Table 1
SCT Pre- and Post-Training Hourly Wages

State	Pre-Training Wages			Post-Training Wages		
	Low	Avg.	High	Low	Avg.	High
Alabama	2.00	4.86	6.67	3.25	6.50	11.00
Kansas	2.00	2.00	6.00	3.25	6.00	10.00
California	4.50	6.50	9.00	4.75	7.00	12.00
Georgia	2.00	3.00	6.00	3.25	6.00	10.00
North Carolina	2.00	6.00	9.00	4.50	6.00	9.00
Kentucky	2.00	2.00	6.00	3.25	5.50	8.00
Massachusetts	2.00	3.00	6.00	4.00	6.50	9.62
Mississippi	1.00	2.00	6.00	3.25	4.50	9.50
New Mexico	.00	2.00	6.00	3.25	5.50	8.00
South Carolina	1.50	2.25	4.00	3.25	6.00	10.00
Oklahoma	2.00	2.50	5.50	3.25	7.00	10.00
Tennessee	2.00	2.00	4.00	3.25	6.00	10.00
Average	1.92	3.18	6.18	3.54	6.09	9.76

Source: Follow-up Telephone Survey of a Sample of SCT Directors who previously provided data on SCT programs to the Urban Institute (29).

The averages (modes) were not weighted for the number of trainees in the program. However, since 1) the SCT states with the higher benefits like California also tended to have larger numbers of trainees, and 2) SCT programs were analyzed to have higher benefit/cost ratios than did CETA, this limitation was not restrictive.

The low category was predominantly characterized by persons who were unemployed. This reduced the average hourly pre-training wage for the low category to \$1.92. The average pre-training wage for the twelve states was \$3.18 while the high wage was \$6.18. These data were annualized providing \$3,840, \$6,360, and \$12,360 pre-training wage levels for the low, average, and high categories, respectively.

The post-training wages for the SCT participants were also provided by the twelve states in the sample in the same low, average and high format. These were averaged for all states and categories in the sample and produced a \$3.54, \$6.09, and \$9.76 hourly wage for the low, average, and high respectively. On an annualized basis, the values for the low, average, and high were \$7,080, \$12,180, and \$19,520, respectively.

The annualized pre-training wages for SCT were then subtracted from the annualized post-training wages on a low to low, average to average, and high to high basis. This appeared to be a reasonable method for obtaining annual wage benefits since those entering programs at the low wage level would most likely be in the low-wage group upon program completion. The net benefits of training on a low, average, and high basis are presented in Table 2.

Table 2
SCT Annualized Net Wage Benefits
(in dollars)

	Low	Avg.	High
Post	7080	12180	19520
Pre	3840	6360	12360

Net	3240	5820	7160
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The next step was to examine the discounted benefits stream for SCT trainees over different work-life scenarios and discount rates. Assuming a trainee was twenty-five upon completing SCT and then worked until sixty-five, a work-years scenario of forty was used. Similarly, thirty-five years of work was used for a trainee completing training at age thirty and so forth down to a work-life scenario of five years. Since the annual benefits to training were calculated on a basis of up to three years after training, calculations are not shown for those years. Rather, it appear reasonable to simply begin with a five-year work-life scenario.

The discount rates were set at seven, ten, and thirteen percent which adequately represent the range of opportunity costs for capital (ten percent is considered to be the standard by the Office of Management and Budget, United

States Government). The results of this analysis are shown in Appendix B and are incorporated in the benefit/cost ratios developed later in this section.

2. SCT Program Costs

The next step was to calculate training program costs. The SCT programs had trainee costs that ranged from a low of \$81 to a high of \$962 with an unweighted average of \$384 (see Appendix A for detailed data on SCT program costs). The low program cost of \$81 per trainee was well below the average cost and appeared to be unrealistic. The next lowest program cost figure was \$133. Therefore, the \$133 cost estimate was utilized in the analysis.

3. Benefit/Cost Ratios

Benefit/cost ratios were calculated for the low, average, and high benefit levels separately for the low, average, and high cost level. Each of these calculations were further calculated at the 7%, 10%, and 13% discount rates. The results are shown in Tables 3-5.

All SCT benefit/cost ratios were greater than one for all discount rates, working life scenarios, and alternative wage differentials between pre-training and post-training wage levels. The ratios ranged from a high of 718 for a forty-year work-life, seven percent discount rate, low program cost of \$133 and high benefit of \$7160 to a low of 12 for a five year work-life, a thirteen percent discount rate, high program cost of \$962 and low benefit of \$3240.

TABLE 3

BENEFIT/COST RATIOS:
STATE CUSTOMIZED TRAINING

WORK YEARS	DISCOUNT RATE		
	7%	10%	13%

BENEFIT \$3240 COST \$133

40	325	238	186
35	315	235	185
25	284	221	179
15	222	185	157
5	100	92	86

BENEFIT \$5820 COST \$133

40	583	428	334
35	567	422	332
25	510	397	321
15	399	333	283
5	179	166	154

BENEFIT \$7160 COST \$133

40	718	526	411
35	697	519	408
25	627	489	395
15	490	409	348
5	221	204	189

TABLE 4

BENEFIT/COST RATIOS:
STATE CUSTOMIZED TRAINING

WORK YEARS	DISCOUNT RATE		
	7%	10%	13%

BENEFIT \$3240 COST \$384

40	112	83	64
35	109	81	64
25	98	77	62
15	77	64	55
5	35	32	30

BENEFIT \$5820 COST \$384

40	202	148	116
35	196	146	115
25	177	138	111
15	138	115	98
5	62	57	53

BENEFIT \$7160 COST \$384

40	249	182	142
35	241	180	141
25	217	169	137
15	170	142	120
5	76	71	66

TABLE 5

BENEFIT/COST RATIOS:
STATE CUSTOMIZED TRAINING

WORK YEARS	DISCOUNT RATE		
	7%	10%	13%
	BENEFIT \$3240		COST \$962
40	45	33	26
35	44	32	26
25	39	31	25
15	31	26	22
5	14	13	12
	BENEFIT \$5820		COST \$962
40	81	59	46
35	78	58	46
25	71	55	44
15	55	46	39
5	25	23	21
	BENEFIT \$7160		COST \$962
40	99	73	57
35	96	72	56
25	87	68	55
15	68	57	48
5	31	28	26

Calculations for work-life scenarios less than five-years are not shown as explained earlier. However, since the benefits to training are assumed to remain constant over the various work-life scenarios, calculations for the years 1-5 do show similar trends.

B. Analysis of CETA

1. Annual Benefits From Training

The first step was to establish the average annual benefit level for CETA trainees. The data as taken from the CBO study (30) indicated little or no benefit for males over the two-year period for which benefits were assessed. Therefore, in order to strengthen this analysis, it was decided to use female CETA trainees because they had positive average annual net benefits (pre- minus post-training wages), over that two-year period, i.e., an average low of \$700, an overall average of \$1050, and an average high of \$1400 (31). Since SCT turned out to have higher benefit/cost ratios, this assumption was not restrictive.

The next step was to examine the discounted benefit stream for CETA women over different work years and discount rates. Assuming a woman trainee was twenty-five upon completing CETA training (only women 25 years of age and older were in the CETA sample) and then worked until sixty-five, a work-life scenario of forty was used.

Similarly, thirty-five years of work was used for a women completing training at age thirty and so forth.

The discount rates were set at the same levels as for the analysis of SCT programs, i.e., seven, ten, and thirteen percent which adequately represent the range of opportunity costs for capital. The discounted benefits stream for CETA women is shown in Appendix C.

2. Costs of CETA

The next step was to identify the costs of CETA programs for women. The costs were presented in the CBO study (32) and ranged from a low of \$2100, an average of \$2400, and a high of \$2700.

3. Benefit/Cost Ratios

Benefit/cost ratios were calculated for all three benefit levels separately against the low, average, and high cost levels. The results are shown in Tables 6-8 and indicate that training for CETA women has benefit/cost greater than one in nearly every scenario. The ratios ranged from a high of 8.84 for a forty-year work life, seven percent discount rate, high benefit, and low cost to a low of .91 (not greater than one) for a five-year work-life, thirteen percent discount rate, low benefit, and high cost.

TABLE 6

BENEFIT/COST RATIOS:
CETA WOMEN

WORK YEARS	DISCOUNT RATE		
	7%	10%	13%

BENEFITS=\$700 COST=\$2100

40	4.42	3.25	2.54
35	4.32	3.21	2.53
25	3.18	3.03	2.44
15	3.04	2.54	2.15
5	1.37	1.26	1.17

BENEFITS=\$1050 COST=\$2100

40	6.63	4.88	3.81
35	6.47	4.82	3.79
25	5.83	4.54	3.66
15	4.55	3.80	3.23
5	2.05	1.90	1.76

BENEFITS=\$1400 COST=\$2100

40	8.84	6.50	5.08
35	8.63	6.43	5.06
25	7.77	6.05	4.89
15	6.07	5.07	4.31
5	2.73	2.53	2.34

TABLE 7

BENEFIT/COST RATIOS:
CETA WOMEN

WORK YEARS	DISCOUNT RATE		
	7%	10%	13%

BENEFITS=\$700		COST=\$2400	

40	3.87	2.85	2.22
35	3.78	2.81	2.21
25	3.40	2.65	2.14
15	2.66	2.22	1.88
5	1.20	1.11	1.03
BENEFITS=\$700		COST=\$2400	

40	5.80	4.27	3.34
35	5.66	4.22	3.32
25	5.10	3.97	3.21
15	3.98	3.33	2.83
5	1.79	1.66	1.54
BENEFITS=\$1050		COST=\$2400	

40	7.74	5.69	4.45
35	7.55	5.63	4.42
25	6.80	5.29	4.28
15	5.31	4.44	3.77
5	2.39	2.21	2.05

TABLE 8

BENEFIT/COST RATIOS:
CETA WOMEN

WORK YEARS	DISCOUNT RATE		
	7%	10%	13%

BENEFITS=\$700 COST=\$2700

40	3.44	2.53	1.98
35	3.36	2.50	1.97
25	3.02	2.35	1.90
15	2.36	1.97	1.68
5	1.06	0.98	0.91

BENEFITS=\$1050 COST=\$2700

40	5.16	3.79	2.97
35	5.04	3.75	2.95
25	4.53	3.53	2.85
15	3.54	2.96	2.51
5	1.59	1.47	1.37

BENEFITS=\$1400 COST=\$2700

40	6.88	5.06	3.95
35	6.71	5.00	3.93
25	6.04	4.71	3.80
15	4.72	3.94	3.35
5	2.13	1.97	1.82

C. A Comparison of SCT and CETA

Within the limitations previously cited, it is necessary to determine which of the two publicly supported training programs is most cost-effective. The appropriate place to start is with a comparison of benefits and costs of the two programs. A summary of the SCT/CETA annualized benefits and costs are shown in Table 9.

Table 9

A Comparison of SCT/CETA Training Costs
and Annualized Benefits
(in dollars)

	Training Costs			Annualized Benefits		
	Low	Avg.	High	Low	Avg.	High
CETA	2100	2400	2700	700	1050	1400
SCT	133	384	962	3243	5830	7157

When these benefit and costs were developed into benefit/cost ratios, the results indicated that SCT programs were cost-effective. By way of background, CETA women were utilized as the comparison with SCT since CETA males did not experience positive results from training as measured in higher net benefits. Therefore, an approach which biases the results towards the CETA program graduates was adopted, namely using CETA women graduates.

The benefit/cost ratios for CETA were greater than one for nearly every work-life, discount rate, program benefit and program cost scenario. However, SCT had higher

benefit/cost ratios in every instance, i.e., there were higher benefit/cost ratios for the range of all program benefit and cost levels as well as every discount rate and work-life scenario.

The most effective way to demonstrate the higher values of SCT benefit/cost ratios is to compare selected values of each program at critical points in the analysis. Table 10 shows that under the most favorable scenario of a seven percent discount rate, forty-year work-life, and highest benefit, the cost-effectiveness ratios are far apart with CETA yielding benefit/cost ratios of 8.84, 7.74, 6.88 and SCT yielding 718, 249, and 99 for the low, average, program costs, respectively.

Table 10

A Comparison of SCT/CETA B/C Ratios
(7% Discount Rate, 40-Year Work-Life,
Low, Average, and High Program Cost Levels)

	Low	Avg.	High
CETA	8.84	7.74	6.88
SCT	718.00	249.00	99.00

Table 11 shows that at the more unfavorable end of the spectrum, i.e., a thirteen percent discount rate, five-year work-life, and lowest benefit, the cost-effectiveness ratios remain far apart with CETA yielding ratios of 1.17, 1.03, and .91 and SCT yielding ratios of 86, 30, and 12 for the low, average, and high program costs, respectively.

Table 11

A Comparison of SCT/CETA B/C Ratios
(13% Discount Rate, 5-Year Work-Life,
(Low, Average, and High Program Cost Levels)

	Low	Avg.	High
CETA	1.17	1.03	.91
SCT	86.00	30.00	12.00

Placement rates for CETA trainees were lower than for SCT trainees. The placement rate for CETA was approximately sixty-six percent (32) while the placement rate for SCT was over ninety percent (33). However, no adjustments were made for these differential employment rates, i.e., post-training average wages did not include those who were not employed (zeros). Since the analysis already shows SCT to be more cost-effective than CETA, this limitation was not considered restrictive.

V. CONCLUSIONS

This thesis examines two specific publicly funded training programs: State Customized Training (SCT) and the job training sections of the Comprehensive Employment and Training Act (CETA).

These two programs were selected because 1) they represent two different philosophies regarding how to achieve the same objective, i.e., SCT attempts to achieve gainful employment for its trainees through explicit pre-training employment agreements with specific firms while CETA does not have such agreements for its trainees being more concerned with employment after the training is complete, and 2) both programs will continue to be used for training because CETA is a model program that is currently embodied in CETA's replacement, i.e., the Job Training Partnership Act of 1982 (JTPA), and SCT because it is a program that appears to be increasingly used.

For purposes of this thesis, the pre-training agreement programs were taken as those programs that utilize specific job vacancy data derived from new or expanding firms for program planning. The programs are funded only when there is a high probability that the majority of the trainees will be hired upon program completion. Information about the vacancies is collected before training is funded. Additional data on job descriptions, production schedules, wage rates, and hiring dates are also considered critical.

This information is then put into a training agreement so that both the SCT program officials and firm representatives clearly understand the training objectives.

In contrast, the non-agreement programs were taken as those programs which concentrate on preparing trainees for employment in a more general sense. That is, although the programs may provide training for specific occupational categories, there is generally no training agreement for program graduates to fill specific job vacancies for specific firms. In addition, the non-agreement type programs often concentrate on considerations such as worker attitudes, high school completion units, punctuality, and;basic literacy skills, abilities that SCT trainees may already possess. Emphasis on specific employment opportunities begins in earnest after graduation rather than before the training program is initiated.

To the extent that SCT and CETA are representative of employment agreement and non-employment agreement programs, respectively, the major conclusion is that employment agreement training programs appear to be more cost-effective than non-employment agreement programs. This conclusion is likely generalizable to other programs that have similar employer agreement/non-agreement orientations subject to the previously discussed limitations of this analysis.

The limitations of the data are many and therefore weight heavily on any recommendations. Specifically, the

opportunity cost of foregone income was not empirically treated because the data were not available.

Another limitation is the possibility that firms might have contributed either directly or indirectly to SCT program expenses which have reduced program costs. Although state SCT directors were requested to report all costs, it is possible that some contributions were not reported.

Yet another limitation was the low income eligibility requirement for CETA trainees mentioned in Section II of this thesis. This requirement might have significantly influenced the type of CETA trainee recruited. Finally, the data were collected for the most part at one point in time and the estimates do not account for the distributions, therefore they may not represent the reality of a longer time frame.

Having recounted some of the most prominent limitations, it is important to note that SCT programs are designed to work closely with firms that have a need for trained workers. Training program designers and managers who build credibility with the private sector through meeting their specific needs for skilled workers, appear to have a distinct advantage in reducing information, job search, and training costs.

Last, there is a need for more data on CETA and other federally sponsored employment and training programs as well as SCT. There is a need for detailed follow-up studies with

particular attention paid to population variables and labor participation before, during and after training.

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APPENDIX A

State Customized Training
1981

State	Budget	Firms Assisted	Trainees	Average Cost Per Trainee
Alabama	1,100,000	78	3,271	336
California	1,000,000	344	6,835	146
Georgia	3,200,000	58	6,200	516
Kansas	32,533	4	72	452
Kentucky	400,000	50	3,000	133
Massachusetts	5,000,000	71	5,562	899
Mississippi	450,337	176	5,588	81
New Mexico	300,000	24	1,038	289
North Carolina	2,223,848	80	5,819	382
Oklahoma	1,000,000	24	1,039	962
South Carolina	993,000	77	3,793	262
Tennessee	962,168	157	6,408	150
Average				384

Source: Larry C. Ledebur and David W. Rasmussen, State Development Incentives, (Washington, D.C.: The Urban Institute, May 1983), p. 2-23.

APPENDIX B

DISCOUNTED BENEFITS STREAM
STATE CUSTOMIZED TRAINING

WORK YEARS	DISCOUNT RATE		
	7%	10%	13%

\$3240

40	31666	20790	14736
35	30779	20519	14651
25	27790	19378	14201
15	21909	16418	12675
5	10341	8743	7496

\$5820

40	56882	37345	26471
35	55289	36857	26317
25	49919	34808	25509
15	39355	29492	22769
5	18575	15705	13465

\$7160

40	69979	45943	32566
35	68018	45343	32376
25	61412	42822	31383
15	48416	36283	28011
5	22852	19321	16566

APPENDIX C

DISCOUNTED BENEFITS STREAM
CETA WOMEN

WORK YEARS	DISCOUNT RATE		
	7%	10%	13%

\$700

40	9285	6830	5339
35	9063	6751	5310
25	8158	6354	5131
15	6376	5324	4524
5	2870	2654	2462

\$1050

40	13928	10245	8008
35	13595	10126	7965
25	12236	9531	7696
15	9563	7986	6785
5	4305	3980	3693

\$1400

40	18571	13660	10678
35	18127	13502	10620
25	16315	12708	10262
15	12751	10649	9047
5	5740	5307	4924

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An Analysis of the Cost-Effectiveness
of Selected Government-Supported Training Programs

by Paul V. Braden

(Abstract)

In certain situations, information costs and training related externalities may lead to under investment in human capital, i.e., a non-Pareto equilibrium in which marginal social return to human capital investment exceeds its marginal social cost. When this situation occurs, it may be economically sound to have the public sector make selected human capital investments.

The purpose of this thesis is to assess the comparative cost-effectiveness of two general types of publicly funded training programs: those with explicit training and employment agreements between firm representatives and training officials as characterized by State Customized Training (SCT) and those with no such agreements as characterized by the Comprehensive Employment and Training Act (CETA) programs.

The methodology was to conduct a cost-benefit analysis of the benefits to the programs' graduates and the costs to the public over various working-life scenarios and discount rates. The benefit-cost ratios were higher for SCT for every scenario tested. The conclusion reached was to the extent that SCT and CETA are representative of agreement/non-agreement types of training programs, training

programs with training and employment agreements are more cost-effective than those programs without such agreements.