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THE EFFICIENCY OF TARGETED JOB CREATION: CONJECTURES BASED ON THE EARLY SUPPORTED WORK EXPERIENCE

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ABSTRACT

Targeted public service employment is currently the topic of considerable debate. Advocates present it as a solution to the problems of chronic unemployment and poverty--a solution which has the additional benefit of providing needed social services. Critics argue to the contrary that public employment will be expensive and public employees will simply do "make-work." Both advocates and critics, however, argue at an abstract level, without a sense of realism about both the problems and the potential of direct job creation.

This paper presents, within the context of a specific program demonstration, a framework for evaluating the efficiency of public employment programs and examining potential trade-offs among the multiple goals of such programs. The analysis is based on insights gained from examining the early experience of a particular public service employment program called Supported Work, which is currently in the second year of a national demonstration. Supported Work provides short-term work experience to particular groups of people with well-documented labor market difficulties--ex-addicts, ex-offenders, AFDC mothers, and unemployed disadvantaged youth. The primary objective of the program is to prepare them by this work experience to be able to get and keep a job in the regular labor market.

Based on a priori reasoning, since empirical evidence is not yet available, the paper argues that designing a program which is efficient in the economist's sense is likely to be difficult. If it were easy to make large efficiency improvements, the argument is made, some

existing institution would already have had an incentive to make them. To be successful in terms of economic efficiency, therefore, a public employment program must be a social innovation. The real policy challenge, the paper concludes, is to design the organization and incentives so that successful innovations survive and grow and the unsuccessful ones are killed off.

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The Efficiency of Targeted Job Creation: Conjectures Based on the Early Supported Work Experience

Public service employment is currently the subject of considerable discussion and debate. This interest arises at least in part because public employment promises to solve a number of social problems related to the unemployment of disadvantaged workers. Public employment directed at those with labor market disadvantages promises a way to improve the unemployment/inflation tradeoff by providing jobs specifically for those groups whose unemployment is high regardless of the aggregate unemployment rate. It therefore reduces unemployment without tightening labor markets generally. Public employment also attacks poverty directly, by providing satisfying employment and income to disadvantaged workers. It may thus reduce associated problems of crime, drug use, and welfare dependence. Moreover, because the work experience creates job skills and

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a work record which makes it easier to find and hold a regular job, public employment may have lasting effects. Finally, in the process of gaining work experience, public employees are expected to produce needed social services which financially pressed cities cannot provide.

This paper presents a framework for evaluating the efficiency of public employment programs and examining potential trade-offs among the multiple goals of such programs. Our analysis is based on insights gained from examining the early experience of a particular public service employment program called Supported Work, which is currently in the second year of a national demonstration. Supported Work provides short-term work experience to particular groups of people with well-documented labor market difficulties--ex-addicts, ex-offenders, AFDC mothers, and unemployed disadvantaged youth. The primary objective of the program is to prepare them by this work experience to be able to get and keep a job in the regular labor market.

Section I presents a brief description of the national Supported Work demonstration. Section II discusses the tasks involved in job creation and the evaluation criteria used. Sections III and IV contain the heart of the analysis of the efficiency trade-offs; the final section summarizes the implications of the analysis.

I. THE SUPPORTED WORK PROGRAM

The goals of public service employment are unquestionably laudable and would probably be endorsed by most voters. It is important, therefore, to have a realistic sense of the extent to which these goals can be attained. Advocates of public service employment often argue that there are many needed social services to be provided by such a program but overlook the practical issues of identifying those activities and mobilizing the resources needed to produce the output. Critics, on the other hand, often reject the idea simply because of its alleged administrative nightmares and inefficiencies. Neither advocates nor critics have carefully examined the practical aspects of implementing a job creation program nor have economists done sufficient theoretical or empirical research for the development of an evaluation framework. In short, as with any new social program, the gap is considerable between the general statement of goals and the reality of developing a specific, implementable program design to further these goals.

The experience of the national Supported Work demonstration can add a sense of realism to the debate. Examination of the experience of a particular kind of public employment program, can provide a realistic sense of the trade-offs that are likely to exist among multiple program goals. Ultimately, the evaluation of the demonstration will have quite a bit to say about such job creation programs. It should tell us about the effect of the program upon the post-program employment opportunities of participants and something about the extent to which participants produce useful social output while in the program. This information is not yet available. Nonetheless, there is sufficient experience to

suggest some hypotheses about alternative job creation strategies and their probable effectiveness. Before discussing these hypotheses, we describe the Supported Work program briefly so that readers can assess the generalizability of our analysis based on its experience.

Supported Work is a particular example of a transitional public employment program for workers with serious employment difficulties. A national demonstration is currently being conducted in fifteen cities by the Manpower Demonstration Research Corporation.* The demonstration is funded by the Ford Foundation and a consortium of federal agencies led by the Department of Labor.**

This demonstration was developed in part to expand on a pilot program, initiated by the Vera Institute of Justice in New York City. The pilot began as an innovative program to rehabilitate former drug addicts by providing them with work experience in low stress jobs. It later expanded to include ex-offenders and women receiving AFDC, and has now become a nonprofit corporation to provide public services to the city of New York.

The national Supported Work demonstration as a public employment program has three distinguishing characteristics:

•Dual objectives - It is designed both to provide participants with job skills which will increase their earnings after the program and to produce useful social output during their participation in it.***

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*Readers interested in more detail about the Supported Work Demonstration and its evaluation should consult the First Annual Report of the National Supported Work Demonstration, Manpower Demonstration Research Corporation, December 1976.

**For the complete list of agencies, see p. iii.

***Depending on the target group, Supported Work has the additional objectives of reducing welfare dependence, drug use, and crime and of getting high school dropouts to return to school.

• Targeting - It is designed for individuals with severe labor market problems.

• Independent organizational structure - It is operated by organizations which are, in almost all cases, independent of the local government, and for which running the program is an important, if not the only, purpose.

The specific target groups are ex-addicts, ex-offenders, unemployed disadvantaged youth, and women who are long term recipients of AFDC. By enforcing strict eligibility criteria and paying low wages the program ensures that only individuals with the most severe labor market problems participate. Participants are far more disadvantaged than those in the more familiar public employment programs (e.g., PEP and the programs funded under CETA Title VI).*

The Supported Work demonstration is being operated at fifteen sites by local organizations responsible for running the demonstration in their particular city. Because these local organizations must match their national funding by marketing their output or by raising untied grants, the programs must sell the program as well as its output to the local communities. And because Supported Work is new in most of the cities, with emphasis on designing special jobs, sites have had to establish entire production operations in order to provide job experience.

The premise of the Supported Work program is that these groups can be successfully employed if work is done in the company of their peers

*Over two-thirds of the first year's participant population has no educational degree, one-fifth has never held a job, and the average work experience in the six months before joining the program is eight and one-half weeks. Among the ex-addict and ex-offender groups the average number of adult convictions is four. All the groups except those on AFDC have spent some significant amount of time in correctional institutions. Specific figures are available in MDRC op. cit.

(who provide "peer group support"), and under close and supportive supervision. The system of rewards and punishment is intended as one of "graduated stress." Productivity, attendance, and punctuality demands placed on workers are to be low initially and gradually increased, until they reach normal labor market standards.

That creating special jobs is a good way to improve the future employment and earnings of program participants may be argued from several points of view, depending on different assumptions about the specific labor market problems of these target groups. From one perspective, program jobs can be linked to regular post-program jobs in such a way that participants flow from one to the other. The program job develops skills which enable participants to make that transition. This is the model used in later sections of this paper, where we discuss hypotheses about the relation between various program strategies and the future employment gains of participants. From another perspective, work experience in and of itself develops habits, skills, and motivation which are not tied to a specific occupation but make the individual employable in the labor market generally. A third model might suggest that by succeeding at special jobs, employable and motivated persons can develop an employment record which distinguishes them from an overall group which is viewed as a poor employment risk by regular employers. (There are other perspectives and variations on these models, but these are the three most common perspectives.)

Because the program is a demonstration, its individual projects are small relative to the size of the relevant local labor markets. At the end of 1976 the largest of them had just under three hundred

participants, and over half the programs had fewer than a hundred participants. Its experimental status also subjects the program to research-imposed constraints on operations which would not exist for an ongoing program.

Supported Work is distinguished from countercyclical public employment programs because it operates continuously irrespective of economic conditions and seeks to increase post-program earnings. That is, it is an employment policy to provide jobs for specific groups of workers and, in the process, to upgrade their job skills and employability. It is different from sheltered workshops because, although it is an ongoing program, it is transitional for the program participants.* It is different from manpower training programs because it is designed to improve employability through direct work experience rather than counselling, classroom education, or formal job skills training. Most past manpower programs have not concentrated on these groups of the population (except for disadvantaged youth), and many of the programs have had direct or indirect incentives to select the most promising participants and therefore avoid these target group members. In many cases, the local Supported Work programs are established solely to develop jobs for and employ members of the target groups. This organizational structure provides the incentive of survival to guarantee the jobs created go to disadvantaged workers.

The type of work done by the participants has been extremely varied, ranging across a great many industries, as shown in Table 1. Despite

*Depending on the local program, the length of stay in the program is limited to either one year or eighteen months.

**An important example is the random assignment of eligible persons to participate or control group status. On average a program takes in half of the eligible individuals referred to them.

Table II-1

Distribution of Supported Work Participant Hours Worked by Industry During First Five Quarters

Industry (Standard Industrial Classification)	% Hours Worked	
Agriculture (01-09)	7.79%	
Construction	38.77	
General Bldg. Contractors (15)		8.93%
Painting (1720)		12.69
Wrecking & Demolition (1795)		2.19
De-Leading (1799)		6.40
Other Special Trades (all oth 17)		8.56
Manufacturing	3.96	
Furniture (25)		.87
Printing (27)		1.80
Other Manufacturing (24, 28, 31, 32, 36)		1.29
Transportation, Communications, and Utilities (42, 47)	3.52	
Wholesale Trade (50)	.93	
Retail Trade	3.73	
Gasoline Service Stations (5540)		1.36
Eating & Drinking Places (58)		2.20
Other Retail Trade (52 & 59)		.17
Services	40.22	
Clerical Services (7330 & 7339)		8.71
Cleaning & Maintenance (7349)		12.48
Guard Services (7393)		2.05
Microfilming (7399)		3.33
Other Business Services (all other 73)		3.24
Auto Repair Services (75)		3.70
Reupholstery & Furniture Repair (7640)		1.74
Health Services (80)		.86
Educational Services (82)		1.88
Social Services (83)		2.01
Other Services (79, 7620, 89)		.22
Not Classified	1.07	
Total	100.00	

Source: Tabulations of Supported Work Management Information System data.

this variety, the jobs tend to be concentrated in relatively low skill activities, with correspondingly low wages in the private sector. This is by no means true of all activities, but overall the jobs require relatively little skill. Also, with some exceptions, the production processes tend to be fairly labor-intensive. The type of work is approximately evenly divided between production of tangible output and production of services. Most activities are in industries where barriers to entry are quite low. Possible exceptions include General Building Contractors and Other Special Trade Contractors and some of the areas which only occur in the public sector, such as educational services and social services. But ease of entry is quite high, by and large, and the markets are competitive.

As one might expect, most of the work is done for the public or nonprofit sectors. A portion of the output, however, is sold on a competitive, fee-for-service basis. While much of the work is traditional public employment work, the production and marketing activities of a significant number of projects closely resemble those of a private firm. Although some of the output was sold at market prices, a substantial portion was provided as a public service free of charge or for a nominal fee below the prevailing market price.

In the first year and a half, the survival and growth of the program has clearly demonstrated the feasibility of direct job creation on this scale for disadvantaged workers. It has also demonstrated the extraordinary difficulty faced by operators attempting to create jobs, especially during periods of high unemployment. Matching jobs to an extraordinarily disadvantaged group of workers is difficult under any circumstance. During

a recession, lay-offs of local government workers and the reduced level of private sector demand makes the task of job creation all the more difficult. On top of this, because it is a demonstration, the program operates under additional constraints imposed by the experimental research design.

If the program has been faced with some special constraints, it also has some special advantages. Its small size may have enabled it to avoid some problems which a large scale program would confront. The largely unrestricted funding from MDRC, while covering less than the full expenses, providing a financial base which is unusually fungible among types of expenditures for social programs of this kind and which gives the program greater flexibility.

This brief description of the program has been presented so that readers can judge for themselves whether the program and the economic environment it faces is so atypical that generalization to other programs is inappropriate. If the examination of a specific program runs the risk of producing conclusions which cannot be generalized, it has the advantage of being concrete. It is this concreteness which we hope will provide a useful sense of realism about job creation.

II. JOB CREATION TASKS AND EVALUATION CRITERIA

Implementing a job creation program for disadvantaged workers which is economically efficient is likely to be very difficult. Moreover, it will come as no surprise to economists that it is hard to increase economic efficiency by producing new outputs. If we start from the very simple, if extreme, assumption that markets and governments are allocating resources efficiently, then the marginal benefits of additional output will equal marginal production costs in all sectors of the economy and outputs will be produced with minimum social costs. In such a situation, by definition, no program will be able to increase economic efficiency.

No one, however, not even an economist, believes that markets and governments allocate resources with perfect efficiency. While the economy may move in such a way as to eliminate large disparities between marginal benefits and costs, there are undoubtedly numerous opportunities for improving the efficiency of resource allocation. This line of argument suggests that if the program is to be successful in terms of the economic efficiency of the output produced, then it must exploit those discrepancies by discovering innovative management techniques, creating new outputs, expanding output in monopoly markets, identifying unmet public needs--in general identifying and rectifying market failure.*

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*A similar argument can be made concerning the effectiveness of the program in improving post-program employment opportunities of participants. The last decade has established that no easy, generally accepted solution to employment problems of the disadvantaged has been found. In contrast to the output markets, there is less reason to presume that existing labor market outcomes are fully efficient. Moreover, distributional concerns are especially important in labor markets. Nonetheless, the fact that no easy solution to the labor market problems of the disadvantaged has been found suggests that to be successful in raising post-program incomes, an innovative program design or implementation is needed.

We are concerned here to analyze the reasons why efficient job creation is likely to be difficult, and the nature of the trade-offs among program objectives that are likely to exist. This analysis may then enable us, as empirical evidence later accumulates, to suggest ways of adapting job creation strategies to make them more efficient.

The tasks of creating jobs in a public employment program like Supported Work are analogous to those of operating a private firm in that the production process must be organized and the output "marketed". They are far more complex, however, because a public employment program has additional objectives and constraints. The tasks of organizing production differ from those of a private firm because of the special characteristics of target group members and the additional objective of providing work experience which creates job skills useful in post-program jobs.

In the long run, the survival of the program depends not only on its ability to organize the production process but also upon its ability to persuade its customers that they should want the output produced. The very nature of a public service employment program makes this "marketing" task different from that of a private firm. Because it pays low wages and is supported by public funds, certain marketing strategies are illegal or politically inadvisable. At the same time, its special status as a subsidized social program creates a number of possibilities for expanding output which are not available to a private firm.

More generally, in pursuing these goals, the operator of a public employment program has no one to imitate. The manager of a private

firm often enters a market where existing firms' operating procedures provide models for organizing the production process and marketing output. Their performance provides a standard to which a new firm can compare itself. Because few such models and standards exist for the operator of a public employment program, there is greater uncertainty about the effects of an operator's decisions and about how to judge his or her performance.

Effectiveness, however, must be judged, and such judgments require some evaluation criteria. How should decision-makers evaluate a public service employment program in general and the value of output produced on the created jobs in particular? Innumerable evaluation criteria exist but the general criteria widely used are:

- Budget impact. What is the effect of the program on government receipts and expenditures?
- Equity. How does it affect the distribution of income?
- Overall economic effect. Is the trade-off between inflation and unemployment improved?
- Economic efficiency. Do the social benefits of the program outweigh the social costs?
- Progressiveness. Does the program adapt over time in an innovative manner which improves resource allocation?
- Implementation. How well was the program implemented in relation to its programmatic design?

Different people attach varying importance to these and other criteria. An evaluation should, therefore, present the effects of the program on as many criteria as possible.

This paper deals with the economic efficiency criterion. We do not mean to suggest thereby that it is the most important one. In this kind of program, which also has rehabilitative and redistributive objectives, other criteria may ultimately be more important. But its efficiency is a criterion which economists have a comparative advantage in analyzing, and it is an important criterion, especially when comparisons are being made among various alternative programs designed to achieve the same objectives.

The overall efficiency of a public employment program depends both upon the effect of the program in increasing the post-program earnings of the participants* and upon the value of the output produced while they are in the program. Our emphasis in this paper is on the second of these. The value of output accounted for almost 80 percent of the benefits in the evaluation done by Lee Friedman of the Vera Institute's Wildcat demonstration;** without these benefits, costs would have exceeded benefits by a large amount. More generally, public criticism of public employment as "leaf-raking" (meaning practically valueless in terms of output) together with the paucity of existing research on value of output make it worthy of analysis.

The value of output produced by public employees depends upon two things: (1) the productivity of the public employees and (2) the

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*There may be additional economic efficiency benefits of a program depending on the target group. For example, providing jobs for ex-offenders might reduce crime.

**Lee S. Friedman, "An Interim Evaluation of the Supported Work Experiment," Policy Analysis, Spring 1977. See also, Lee S. Friedman, "The Use of Ex-addicts to Deliver Local Services: The Supported Work Experiment," Chapter 6 in Joel Bergsman and Howard L. Weiner (eds.), Urban Problems and Public Policy Choices, New York: Praeger, 1975.

usefulness of the output produced. We use the term "productive efficiency" to refer to the productivity of the public employment program as compared to alternative suppliers and "allocative efficiency" to refer to the usefulness of the output (regardless of how efficiently the output is produced). For example, public employees who dig ditches and fill them up again could be efficient in production, but the output produced would not be useful. In contrast, park maintenance may be a very useful social service, but a crew which spends all of its time sleeping would not be productive. For the value of output to be high, a project must be efficient in both senses. (Allocative and productive efficiency are defined more precisely and analyzed in Appendix A.)

The distinction between allocative and productive efficiency is not necessary for program evaluation. Overall comparison of value of output to costs is all that is needed. Nonetheless, there are good reasons to want separate answers to the two questions.

First, policymakers are likely to disagree with each other and with researchers about the allocative efficiency of a project. A study which not only presents estimates of the allocative efficiency but also describes both the type of output produced and who receives it is valuable to policymakers because they can then substitute their own judgments concerning the usefulness of the output. What they cannot easily judge for themselves, however, is how much work is being done relative to the inputs used; for that, a measure of productive efficiency is needed. Distinguishing between allocative and productive efficiency, therefore, permits researchers to present the information

a policymaker needs to evaluate the program, rather than burying the controversial value judgments in an overall comparison of value of output to cost.

Second, the separation of the value of output into its two components makes measurement somewhat easier. As will become clearer in later sections, a practical method exists for measuring productive efficiency, but measuring allocative efficiency is much more difficult. The logical separation may make it somewhat easier to place bounds on the overall ratio of value of output to program cost.

Finally, and most important, to be useful in a policy context, an evaluation should go beyond an overall assessment to suggest ways of improving the program. If the public service employees do produce output efficiently, but the program fails to choose the appropriate type of output or fails to allocate it among consumers in ways that are allocatively efficient, this has significant policy implications. If productive efficiency is high but allocative efficiency is low, then overall social value may be low relative to costs because of program management failure rather than low productivity of target group members. It may be possible to redirect this output to other sectors where the benefits are higher. The distinction between productive and allocative efficiency is essential for the analysis of these issues.

In order to say something about the way in which a public employment program could be improved, an evaluation framework is necessary which includes two components: a model of program operator behavior and an analysis of how behavior relates to the evaluation criterion, in this case economic efficiency.

The current state of the art provides little foundation upon which to build such a framework. Standard microeconomic maximization theory is not obviously suited to analyzing this range of behavior. Program organizations have a large number of objectives and constraints. The environment they face does not necessarily reward behavior in well-defined or predictable ways. Most important, the "production function" for an untried social program is basically unknown. Application of constrained maximization tools is therefore difficult and not likely to capture the essence of the problem. Institutional theories are likely to be helpful for analysis of this problem, but existing models are fairly case-specific and not easily used to analyze the relation between behavior and evaluation criteria such as efficiency. The challenge is to model behavior so that the relevant objectives, environmental constraints, and institutions are included, and the relation between policies and normative criteria is apparent.

In the subsequent sections we hope to strengthen this foundation by defining the different strategies for organizing production and marketing output and by analyzing, a priori, the likely relation between the strategies and efficiency. The next section focuses on organizing production and productive efficiency; the following one, on marketing output and allocative efficiency.

III. ORGANIZING PRODUCTION AND PRODUCTIVE EFFICIENCY

In this section, we discuss the range of alternatives for organizing production, and look at the factors likely to affect productive efficiency.

"Productive efficiency," as we have defined it, can be measured by comparing the market cost of providing a service to the cost of providing the same service through public service employment. Given the assumption that the alternative private suppliers produce efficiently, the ratio of the alternative suppliers' cost to the program's cost will indicate the productive efficiency of public service employment as compared to feasible alternative ways of producing the same output.

In order to formulate informed hypotheses about what may motivate and constrain program operators in this efficiency context, we analyze some preliminary evidence from the Supported Work demonstration by comparing eleven projects on which there are already case studies of productive efficiency.* We then draw some inferences about productive efficiency and about trade-offs between efficiency and other program objectives. A great deal of variation is contained in this evidence, making inference quite risky. Yet it does suggest that understanding the sources of the variation and how to manipulate them can lead to improvement in the program's productive efficiency.

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* These studies were performed by Steven Dichter, Gary Fiske, and Stephen M. Werner of Mathematica Policy Research.

Factors Affecting Productive Efficiency

The type of output produced depends on the kinds and levels of nonlabor inputs, the kinds and levels of skill of the labor involved, and the manner in which the inputs are combined in the productive process. The quantity of output produced will depend on the amounts of participant labor, the materials and supplies used, services of capital equipment, and the amount and kind of supervisor labor used.

For instance, Supported Work has been developed to provide a supportive environment for participants and prepare them gradually for regular jobs. The efficiency of specific projects is thus very likely to depend on how much the supportive aspects of the program are stressed as compared to strict adherence to the efficient production of output. Related to this is the issue of the level and type of supervision and support services which accompany the work crews (for instance, technical versus rehabilitative assistance).

There are several other factors likely to affect the productive efficiency of various projects. The skills required to do the work in comparison to the skills of the participants will obviously be important. The managerial requirements for the work will probably vary with the complexity of the project. The supervisory requirements may vary substantially across projects, for example, depending on the extent to which materials and equipment are necessary. The scale at which the project is operated should also influence productive efficiency. In this type of program, projects begin on a relatively small scale which may involve scale diseconomies. Start-up problems and a learning process

accompany any production activity. When all the workers are new, as in this program, start-up costs are even more likely. Hence, the age of project should affect the productivity associated with it.

There is also some reason to expect the productive efficiency of projects to depend on certain aspects of their external environments. Projects operating in a market context for instance, face some competitive pressures and may be able to imitate unsubsidized firms which are directly subject to such pressures.

Finally, there are a great many other variables which may affect productivity but on which we lack evidence in our small sample. Specifically, the degree to which the project serves the low income community, the degree to which the output is a tangible one that can be pointed to with pride, the type and quality of supervision, and the quality of the crew are all variables which might be expected to be important determinants of productivity. A large sample would be required to explore all these hypotheses.

Given the variety of possibilities for organizing work and the factors which can affect productivity, can we predict what behavior is likely? Program operators are likely to have a number of objectives, some in conflict with others. Producing output efficiently or picking activities that can be run most efficiently may or may not be prominent among them. Business firms, regardless of their overall objectives, receive a relatively clear signal in terms of profits if they produce efficiently--perhaps even more convincing is the signal received if they do not produce in a cost minimizing way. In addition, private firms can assess their performance against other similar firms and imitate effective techniques.

The organizations creating special public jobs, in contrast, are rewarded financially for efficient production only slightly, if at all. At this point in the demonstration, for instance, sales revenue plays a fairly small role in the financial security of the program. Neither are they punished for inefficient production as long as the outputs themselves are satisfactory. Productive efficiency may be pursued, but only to the degree that individual program operators conceive it to be an important objective in its own right.

No single pattern emerges from the variety of behavior exhibited in the program so far. Much depends on the individuals who direct the programs*--which is to be expected at this stage, in large part because the design in order to allow for natural experimentation has deliberately not tightly constrained behavior.

Case Studies of Productive Efficiency

At this stage we have only eleven case studies of productive efficiency, some for more than one period, that we use as suggestive evidence. Because the number of studies is small, it would be premature to use them to evaluate the productive efficiency of the program. But we can use them to compare productivity along the dimensions suggested above and suggest hypotheses about the determinants of productive efficiency. Where possible,

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* This particular subject of program director philosophy will be analyzed from an organizational perspective by Joseph Ball in a forthcoming MDRC report documenting and analyzing the implementation of job creation strategies during the first year of the national Supported Work demonstration.

we attempt to enrich the comparisons with some descriptive evidence on the survival of the various types of projects.

Again, we emphasize that patterns in a sample of this size must be viewed as extremely tentative, and should be conceived as a first step in learning about programs of this type as opposed to data with which to evaluate it.

In that spirit, the case studies suggest the following hypotheses:

- the variance in productive efficiency* across projects is quite high;
- start-up costs may be substantial for some activities;
- productive efficiency of lower skill, labor-intensive activities may be higher than that of more complicated, less labor-intensive ones.

Variance of Estimates. The variance of the value of output estimates appears to be quite large, as is likely in this small sample. The high variance of the productivity across projects implies that a large sample of projects must be evaluated to be confident in any patterns observed.

The high variance in productive efficiency has the important policy implication which we have noted. Variation that can be explained by variables under policy control provides an opportunity for improvement in productive efficiency through changes in program design.

Start-up Costs and Economics of Scale. For a number of projects, estimates of productivity are available for the same project during two

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* Our measure of productive efficiency is explained in Appendix A and our method of measuring it is defined in Appendix B.

time periods. Comparison of productivity shows a pattern of striking improvement from the initial start-up period to the subsequent period. Any job requires the worker to perform tasks specific to the job and organization. No matter how educated and skilled the worker, an initial period of learning job-specific procedures is unavoidable; the existence of a "learning curve" is well-documented. In job creation programs these learning periods are likely to coincide for all workers. When a new project is begun, everyone, including sometimes even the supervisor, must learn job-specific skills. Over time, productivity can be expected to improve as the crew learns the procedures and as incapable workers are transferred to other jobs or terminated. But there will be limits to this improvement in a program of this type since the workers who have acquired some level of skill are encouraged to seek a regular job. Thus, by design, this type of public employment program may incur some of society's costs of screening and training disadvantaged workers; for the program, these costs may appear in the form of low productive efficiency.

Economies of scale may also exist, at least at low levels of output.* Since initial output is often low, unit costs will be high initially and fall with increased output. Furthermore, if programs are not permitted (or choose not) to produce for inventory, then any economies of scale will interact with demand. If demand is insufficient to operate the project at an efficient scale, then productive efficiency will be low.

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* Note that the scale of operation is very small; half a dozen workers is a common crew size.

But this source of low efficiency is indicative not of a failure in organizing the production process but rather of a marketing failure.

The hypothesis is thus suggested that there may be a significant start-up period associated with public employment projects. This hypothesis in turn suggests that early evaluation can be misleading. It also raises the question of whether the start-up costs are lower or the start-up period shorter for some projects than others.*

Industry Differences. The sample is too small to do more than speculate about differences in productivity across industries. Nonetheless, the 11 case studies do suggest that productive efficiency may be lower for the retailing projects than for maintenance and painting projects. Manufacturing projects also appear to have lower productivity; however, this is primarily due to their low productivity during the start-up periods. If one examines labor intensity, a positive simple correlation seems to exist between labor intensity and productive efficiency, suggesting that labor intensity may be the industry characteristic which affects productive efficiency for these target groups.

Although they are impossible to separate from the problems of low-skill and inexperience, the problems of managing a production process which requires substantial nonlabor inputs may be especially difficult

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* Although our concern here is not with the usefulness of this kind of public employment as a countercyclical tool, we note that the existence of high start-up costs would make such programs unattractive as macroeconomic stabilization policies.

with workers from these target groups.* The supervisory requirements for these types of projects are likely to be relatively high. Intensive supervision by individuals with supervisory skills, knowledge of specific production processes, and the capacity to relate to target group members are all needed. In addition, the match of individual workers to jobs is likely to be more difficult with projects having higher skill requirements. The necessity of using low-skilled workers for jobs requiring nonlabor inputs may lead to the destruction or damage of equipment and materials. This would not only increase costs directly, but also indirectly through the necessity of more intensive supervision. (Having to re-do tire re-capping and furniture refinishing are examples of such problems that have occurred.)

Other problems have surfaced from participants' lack of particular skills. At least one of the business projects had problems with administrative tasks such as keeping records and accounts. Some jobs (such as library work) have been difficult because reading skills are generally quite low among participants. Lack of drivers' licenses among program workers has been a problem for other projects.

The argument that lower skill, labor intensive projects are more likely to be productively efficient for public employment programs has limits. Experience on some projects suggests that some work is too unattractive to motivate workers at all. A few projects have failed

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* One problem directly related to the materials inputs is theft. Projects located in low income areas are subject to high risk of crime. Termination of one gas station project was considered in part because it had been broken into so many times; some housing rehabilitation projects have had a continuing problem with theft of materials.

because the workers have refused the work. These projects have, however, not generally been organized "in-house," but have been labor contracts to other organizations. If operated in-house it might have been possible to organize the production in a manner which made the work more attractive.

This discussion should be viewed as developing hypotheses to be tested with a larger sample, not as reporting firm results. But the eleven case studies do seem to divide themselves into two groups with a number of correlated characteristics. The projects with high productive efficiency tended to be labor intensive, relatively low-skill, non-market projects which probably have few start-up costs--painting, parks maintenance, and building maintenance. The less efficient ones were market projects which were materials-intensive or equipment-intensive--tire-recapping, furniture refinishing, furniture manufacturing, a gas station, and Christmas tree sales.

In spite of the limitation of small sample size, however, the cross-project comparisons presented above illustrate the types of hypotheses that should be systematically tested when the data are available. Such comparisons will be of particular interest if the effect of project experience on post-program earnings can be tested simultaneously.

Inferences To Be Drawn

The early Supported Work experience demonstrates that this kind of program can put members of these target groups to work. Outputs are being produced. The experience also suggests, however, that matching work and workers is a very difficult task. It is also likely to be even

more difficult, if productivity is not to be reduced, as the program attempts to create relatively skilled jobs. In addition, as people acquire the skills needed to perform the jobs, they will have the incentive to leave the program and seek higher wages. Thus, the difficulty of attaining high productivity should be expected to persist beyond an initial start-up period.*

One question is raised by the above discussion. If management is inherently difficult, if economies of scale combine with insufficient demand to reduce productive efficiency to a low level, or if learning is faster or easier in the presence of other experienced workers, then will locating the production out-of-house increase productive efficiency? By only selling participant labor services and perhaps some extra program supervision, and leaving the marketing and management task to an existing firm or agency, productive efficiency may be increased. There will be a resulting loss in peer support and the ability to specially structure jobs, but this may be offset by the other efficiency gains. Moreover, the program may be able to teach host supervisors about the special work problems of participants and train them to use effective techniques of supervision.

If pushed to its extreme, this argument implies that job creation by new organizations is likely to be less efficient for this population than

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* A further indication of the difficulty of matching workers to jobs is the non-negligible rate of firings and participant termination that is not a result of transition to another job. Whether or not these rates are high or low in comparison with other non-supported jobs, it suggests that even with special design and support, created jobs must face problems of labor relations and discipline. This is a particularly important issue when larger programs guaranteeing jobs are considered. The more unconditional the guarantee, the more difficult the objective of maintaining productivity is likely to be.

some form of general labor subsidy, perhaps with support for extra supervisory needs.

Such a conclusion, however, must be weighed against two things. First is the record of programs which have attempted this, such as JOBS. In most cases they did not serve as disadvantaged a population, and even so were not considered very successful. Second, independent organizations can make selective use of labor service contracts to serve their own needs. To the degree that those needs are or can be made consonant with the goals of the program, there is some pressure to make these conditional labor subsidy arrangements work well. This pressure would not exist under a simple labor subsidy.

Nonetheless, it is important to ask to what extent the difficulty of organizing production is inherent in the task and to what extent it results from specific problems of working with these target groups. If it is simply an inherent problem, then the case for setting up new, independent organizations is weakened. If it is specifically the result of problems of creating attractive jobs for the specific target groups, then the case for a separate program using special management techniques is much stronger.

Another hypothesis suggested by this analysis is that a trade-off may exist between the productive efficiency of projects and the post-program earnings gains of workers on those projects. We have noted earlier that this trade-off may be created if the supervisor or program director emphasizes rehabilitative or training goals, and this reduces the effort exerted to increase productivity. The preceding discussion also suggests, however, that those projects which are easiest to run with a high level of productive efficiency may also be the ones requiring the least skill.

Although such projects may have high productive efficiency, they are less likely to enable workers to develop specific skills that command a high wage in the labor market. Hence a program of this kind should not rely on high productivity projects being linked directly to better paying post program jobs in the same occupation or industry. This is the basis on which we argue that a trade-off between productive efficiency and increased post program earnings might exist.

On the other hand, the productively efficient projects may be valuable in developing general work habits and motivation or in acquiring the credential of a stable work record. Either may improve post program employment opportunities. If so, the hypothesized trade-off between productive efficiency and post program earnings gains may not exist, and the total benefits of the program will be high when productively efficient projects are selected.

The point to be emphasized is that the effect of job creation strategies on during program value of output and post-program earnings gains must be considered together.

IV. MARKETING OUTPUT AND ALLOCATIVE EFFICIENCY

In this section we discuss alternative marketing strategies open to program operators and infer some of the consequences of the various tasks. We focus on how valuable the resulting direct program outputs will be. The decisions made by program operators are likely to be influenced by many, perhaps conflicting objectives, as has been noted. They are quite unlikely to be derived from a strategy which seeks the most allocatively efficient projects using the criteria we have elaborated. However, the likely marketing tactics which operators employ to secure their programs will have differing implications for the value of the outputs. We argue from the narrower perspective of the individual organizations, to whom project survival and growth is the primary task and the clearest signal of success, to the larger perspective of economic efficiency.

Here, as in the previous section, analysis of these questions is based to some degree on limited evidence from the early Supported Work experience but primarily on deductive argument. We are again led to a set of generalizations which should be viewed (like the ones above) as hypotheses for longer term observation, analysis, and testing. A descriptive record is our evidence at this point. It tells us which kinds of activities were developed and survived, which failed, and which were not attempted. The argument involves drawing out reasons why some activities and not others were developed, and suggesting plausible links between those reasons and the factors which affect the allocative efficiency of those activities. We reemphasize that data is not yet available to test these hypotheses.

Factors Affecting Allocative Efficiency

The task of operators of public employment programs is to create jobs for their employees. To do this, operators must find some demand for the outputs of work or some demand for the labor services of program employees in other firms or organizations. Identifying these demands is necessary for the survival of the program organizations. The actions which are taken to secure demand or demanders for the outputs and labor services of program employees and, more generally, demand for the programs themselves are what we mean by marketing output.

Three aspects of marketing decisions are particularly relevant for this analysis. The first is the choice of a market. This includes the choice of actual outputs or activities and the choice of customers for those outputs, which may involve the selection of a segment of a larger market. The second aspect involves the actions taken to disarm or avoid potential opposition to the entry of program activities by existing producers and unions. The third aspect is the extent to which outputs or labor services sold are subject to a market test. This involves pricing policies and efforts to sell outputs by selling the program concept, i.e., the concept of employing particularly disadvantaged groups, and/or producing outputs for the poor.

The value of the outputs of work projects, from the point of view of allocative efficiency, depends on two things: 1) the degree to which project outputs substitute for existing similar outputs, displacing the resources which went to produce those outputs and the extent to which displaced resources are reemployed elsewhere in the economy and, 2) the benefits to consumers of those outputs which do not substitute for existing

outputs. Judgments concerning the usefulness of project output, therefore, depend upon what would have happened in the absence of the public employment program. It is useful to specify the various possibilities. With the introduction of a project into a particular sector, total output in that sector can remain constant, it can increase by the full amount of the program output, or it can increase by less than the full amount of program output. Since the third case is a combination of the other two, the question can be addressed by considering the first two extreme cases.

In the first case, where total output in the sector remains unchanged, the program simply produces output which would have been produced by other suppliers if the program did not exist. Total benefits to the consumers of the output will be the same in the presence of the program as they would have been without it (because the total output consumed is the same in both cases). The efficiency effects of this "displacement" of alternative suppliers depends on what happens to the displaced resources. At one extreme, the displaced resources may be unemployed. Then the value of the public service output is zero because it has simply idled resources which would have produced that same output. At the other extreme, the displaced resources are fully employed producing useful output elsewhere in the economy.

The social benefits of the program's having displaced other producers is the value of the additional output produced by the freed resources. This is customarily referred to as the "opportunity cost" of the resources which would have been used to produce it in the absence of the program (although in this context "opportunity benefit" might be more appropriate).*

*This partial equilibrium analysis assumes there are no adjustment costs of moving resources from one sector to another. A general equilibrium model which analyzed the increase in adjustment costs is needed to estimate the opportunity cost correctly.

Thus, in the extreme case of 100 percent displacement and immediate full employment of the displaced resources--if in other words, the economy is at "full employment" and the resources are mobile--then the value of output equals the opportunity cost of the displaced resources and allocative efficiency is high. If the economy is below full employment or if the displaced resources move to new employment only with long lags, then allocative efficiency is low.

A program of the Supported Work type is targeted at precisely those individuals whose labor market difficulties are thought to persist even at relatively full employment throughout the economy. Under conditions of full employment quick reemployment of displaced resources may be a reasonable assumption. However, to the extent that work projects are developed in markets or submarkets which involved other workers with similar labor market difficulties, the opportunity cost of these freed up labor resources may be quite low. This issue merits further theoretical analysis and results are surely sensitive to one's model of unemployment in the relevent portion of labor and product markets.

The second case, where total output of the good is increased by the full amount of the program output, the value of output equals the marginal benefits of this additional output to consumers. In most economic analyses, the marginal benefits curve is the same as the demand curve for the output, and this will often be the case for the buyers of output of a job creation program. But this will not be the case for many public employment projects because of the special status of this particular type of program as a redistributive and training program, with consequent benefits additional to the output produced.

Specifically, buyers may purchase the output of a public employment program either because they want that output or because it helps the poor, allows the disadvantaged to work, increases their future earnings, reduces crime, etc. Although both components of the demand for output are important, for purposes of the benefit-cost analysis it is useful to separate the "altruism component" from demand for the output per se. That second demand component would exist even if an existing supplier (other than the public employment program) produced it. The separation allows funders to determine the economic cost of their altruism.* The efficiency of redistributing income through public employment can be compared to the efficiency of alternative means of redistributing income, such as welfare payments. In the discussion below, the extent to which the program "sells the program concept" to buyers (by appealing to its redistributive and training benefits) as well as the program output becomes an important dimension of marketing strategy.

What might be the expected behavior of operators of these types of programs in developing work for their employees?** That is, what marketing strategies are feasible and likely to survive in the long run? Our hypothesis is that they are the strategies which do not step on toes (either by lowering prices or by displacing workers), which are not perceived to step on toes (because the incursion is small or its adverse effects diffused among many people), or which step on the toes of people without any power to oppose the job creation. Because Supported Work is relatively small and has been undertaken as a demonstration, its experience

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*For an analysis from this perspective, see Robert Haveman, "Social Employment in Holland: Analysis and Lessons for the United States," presented at this conference.

**The experience of the operators in the Supported Work Program in creating jobs will be documented in detail and analyzed in a forthcoming report by Joseph Ball of MDRC.

in this regard could differ significantly from that of a large-scale, national program. Caution is, therefore, required in generalizing from the experience of the demonstration concerning behavior in response to opposition.

That local program organizations are likely to act so as to avoid possible opposition is another way of saying that the distributional implications of alternative strategies are likely to be important. Distributional effects of particular programs are often not discussed in program evaluations. Benefit-cost analysis, for example, simply asks whether benefits to those who gain outweigh costs to those who do not. However, from a perspective of predicting behavior, the distribution of benefits and costs is likely to be important because the strategies which do not make (identifiable) groups perceptibly worse off are more likely to survive. Adam Smith's well-known argument that what survives in a competitve economy will maximize social welfare does not necessarily follow in the case of public employment programs because there is no mechanism which ensures that what survives is also efficient. When resources are allocated partly through the political system, the distribution of benefits and costs is likely to have a significant effect on behavior. Thus, an efficient project may not survive if it concentrates costs on a well-defined group which has the power to kill it. Conversely, inefficient projects may survive if the distribution of costs is such that no one is made perceptibly worse off.

The marketing behavior observed in the Supported Work demonstration exhibits considerable variety but it can be divided into three general categories: (1) entering output markets where entry barriers are low and charging the market price; (2) selling labor services at below-market

wages; and (3) entering unionized markets after taking steps to avoid potential opposition.

The nature of the markets into which Supported Work projects have been able to maintain some sustained operation is suggestive of what have been feasible operator strategies. At the risk of generalizing from an extremely varied experience we conclude that these markets typically have low barriers to entry. Given that newly formed organizations drawing together a work force of unskilled, long-term unemployed workers can move into such markets, this is to be expected. We also hypothesize that these markets contain an array of suppliers who are not in a position to resist the impacts created by a new entrant such as Supported Work. Although classification necessarily oversimplifies the marketing experience, such markets appear to fall into certain types. The Supported Work activities appear frequently to be operating in subsectors of larger markets. The other suppliers operating in these subsectors are relatively small firms, are less likely to use unionized labor, and have relatively little capital involved in producing outputs. Generally, individual firms do not have market power.* In several of these submarkets there is a high turnover of firms.

For example, the Supported Work programs have been able to develop a good deal of work in the construction industry, including painting, housing rehabilitation, demolition, deleading, and sealing of abandoned buildings. Larger contractors and skilled craft unions appear not to work in the segments of the markets in which Supported Work has been active. The buildings are usually located in low income neighborhoods and are often owned by city authorities or HUD, indicating perhaps that their expected return is low or quite risky.

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* Analytically, the market structure appears to be monopolistic competition.

Another good example is building maintenance, which seems to be an industry containing relatively large firms serving large office buildings and apartment complexes and a subsector of smaller firms serving small customers. This latter subsector has relatively high rates of entry and exit of these smaller firms that appear to utilize short term labor which closely resembles the target groups of this program. These firms are in all probability less likely to notice the entry of a public employment program into the market, and less able to oppose them through the channels that the more powerful large contractors and unions might employ.

The above markets are for outputs. The employment program operates basically as a contractor for these outputs, and the observations above relate to the nature of output or product markets. These employment programs can also operate directly in labor markets by selling labor services to existing firms or public and non-profit organizations. The distinction between selling final services and selling labor in many contexts may be difficult to make and the actual tasks workers perform may be very similar. There may be some important differences, however, in the efficiency implications of the two arrangements. In the Supported Work demonstration most of contracts for labor go to public and non-profit institutions.

There are only a few instances of labor service contracts with private firms, but they suggest that the contracts are for short term labor for which these firms have a variable demand which is difficult for them to meet. In these cases, the program may be providing a service by specializing in the management of their employment in this segment of the labor market.

Labor services that are marketed to the public or nonprofit sector are not as easily analyzed in terms of the categories discussed above.

Two groups of situations seem to have emerged. In the first, labor services are sold to public and nonprofit organizations. When these organizations have not had the budget to support these jobs, the wage paid to Supported Work is likely to be less than the market wage. In the second, labor is sold to organizations with some assurance of eventual "rollover" (placement in regular unsubsidized jobs) for a fraction of the subsidized work crew. Again, the price paid for work during the period before rollover is less than market wage rates.

The jobs in both cases usually involve services--for example, general maintenance, security, and clerical services--and are therefore similar to the case of contracting for these types of service. The difference in the terms of sale, however, may carry different efficiency implications. In the product market, the employment program competes with other contractors and is under pressure to charge prices that do not involve unfair competition. This constraint is absent in the labor market. To the degree that the employment programs have some secure sources of financial support, the price charged for the labor services can be lowered as far as is necessary to make the transaction. There may be, however, an analog to "unfair competition" which affects not the wage rate but the type of work performed, and which results from attempting not to compete with the existing work force of the host organization. To the degree that there is variation in the attractiveness of work tasks, the subsidized employees are very likely to be encouraged to do those tasks which the other workers prefer not to do. An extreme example of not competing with the existing workers is that it appears to be politically difficult for public agencies to take on subsidized work crews from a program of this kind when, for budget reasons, the regular employees are

being laid off, even if the subsidized workers do not compete directly either for funds or work assignments.

The Supported Work program has undertaken a number of projects in partially unionized markets with varied outcomes. In almost all cases, some initial steps were taken to secure programs from possible union opposition by encouraging liasons with local labor union leaders either informally or by having them sit on the boards of the local Supported Work organizations. During the initial period of operation of Supported Work, the position taken by relevent unions as to which types of work will be sanctioned appears to have been an important influence on the course of job development. Some work projects have been explicitly ruled out; others have been limited in size or the scope of tasks that may be performed has been restricted to low level or less appealing tasks; still others have involved agreements with unions permitting the program to work, provided union supervisors were hired. In short, the union response has been varied both across cities and industries, and at this point it is difficult to assess whether this is due to more or less active and powerful unions, or more or less effort by program operators to accommodate or anticipate union resistance before the fact.*

Unions appear to have an important indirect effect on the program through their effect on the markets. By restricting supply, unionization creates an opportunity for expanding output which the program can exploit without necessarily confronting union opposition. In some industries, painting and building maintenance, for example, unions customarily do not

*The relation between the Supported Work demonstration and the unions will be analyzed in much greater detail by Joseph Ball in a forthcoming MDRC analysis.

do certain types of work. This may be either because customers will not purchase the work at union rates, or because it is not suited to the more capital-intensive technology used by union suppliers, or because the work or the areas in which it is located are simply unattractive. Whatever the reason, the informal segment of the market created by the unions is a niche in the existing market structure which the program can enter with less risk of opposition.

While generalizations about the responses of unions is difficult, our interpretation of the early experience suggests that the existence of unions may well result in work projects which do not directly displace union labor, which are marketed at a price below the union price, and which are in the informal segment of the market.

Implications of Alternative Strategies for Efficiency

Although there is obviously a great deal of variety in the type of markets a targeted job creation program such as Supported Work will enter, the thrust of the previous discussion is that the incentives facing such programs will lead them into particular "niches" of the economy. This is the result of the program's size and status, which require that it gain the cooperation of existing institutions and may also require avoidance of established producers' territory.

What can be said about the allocative efficiency of filling these niches? Their relation to the post-program job opportunities of participants? Although there are exceptions, avoiding opposition appears likely to push the program away from activities which are most allocatively efficient and away from activities which generate opportunities for post program earnings gains. The incentives and constraints facing operators appear to create a trade-off between allocative efficiency and other program objectives.

Allocatively efficient projects will be either profitable for an existing supplier or opposed by an existing supplier or union because it threatens displacement. If the mechanism by which the program can improve post-program employment and earnings is by linking specific in-program work experience to post-program jobs, then avoiding opposition may not be effective in generating those linkages. Neither firms, agencies, nor unions now have the incentive to change the terms on which they will hire individuals from these target groups. This kind of program offers some subsidies of limited duration without necessarily changing incentives beyond the period of that subsidy.

Therefore, the gains which individuals may make are more likely to result from the general skills and habits acquired than from direct links of in-program to good post-program jobs.

These arguments are given support by considering each of the specific kinds of marketing strategies that the previous section indicates are likely to evolve. They are of three general types: entering output markets on a competitive basis, selling labor services at subsidized wages, and entering the nonunion segment of a partially unionized market. We consider each in turn.

Entering Output Markets Where Entry Barriers are Low. Channeling of activity into low barrier markets has several implications. If avoiding opposition or legal difficulty induces pricing at or near the market price, as we argue it will, then displacement is very likely. If the displaced resources have poor prospects for re-employment, then the allocative efficiency benefits will be low. Moreover, to the extent that firms in these markets use workers resembling program participants, they will face unimproved employment opportunities in these markets after they leave the program. Thus, to the extent that the displaced workers have better employment opportunities than participants, both the allocative efficiency benefits of displacement and the improvement in post-program employment opportunities will be greater. The program will better achieve both goals, therefore, both by ensuring that the participants in fact have serious labor market problems and by creating jobs in sectors where employment opportunities are relatively good. Our argument suggests that doing the latter will be difficult.

Although we have argued it is less likely, the program could use its federal subsidy to charge below-market prices in output markets. If they do charge low prices they will likely expand output instead of displacing other producers. But charging a low price reduces the market test for this output, thereby making it difficult to ensure that the output is valued. For example, if output is given away free of charge, many potential consumers will demand the output, and there is no mechanism to ensure that the output goes to those who value it most.

Marketing Labor Services at Subsidized Wages. By providing labor services to the public or nonprofit sectors at below market wage rates, the program is most likely to be able to expand output, thereby avoiding the opposition caused by displacement. This output expansion will increase allocative efficiency if its occurs in areas where services are undersupplied.

In the public sector, reasons for undersupply are unnecessary credentials requirements for civil service employment, budget pressures caused by recession, and failures of the local political processes to register fully constituent demands. This last may well be the case for the poor who, it is argued, cannot exert adequate influence in local and state government. Examples of activities designed to fulfill undersupplied social needs are parks maintenance and the cleaning and sealing of abandoned buildings and houses. The challenge to program design, of course, is ensure that these services are really undersupplied and that the work is not merely "make-work." As in the output market case, marketing these projects to local public agencies at low or zero prices eliminates the discipline imposed on the agency to allocate the outputs efficiently by charging market prices. Thus, avoiding opposition

leads the program to charge low prices or appeal to altruism in order to avoid displacement. But charging low prices makes it less certain that the output will be useful.*

The effect of these public sector jobs on post-program job opportunities is difficult to assess. On the one hand, credential requirements for government employment will remain, undersupplied services will remain in undersupply, and public organizations without the budget to hire these additional individuals will still not have these budgets. Hence, one would not expect the identical jobs to be open to participants following the program. On the other hand, work experience in a public employment program may substitute for credentials at some organizations. In any case, if the program can demonstrate that disadvantaged workers can work as productively as credentialed employees and convince governments to drop the credential requirements, their post-program jobs may become available. Second, output of previously undersupplied services may be expanded permanently if the program demonstrates the usefulness of the output; the program may even cause a community to discover a latent demand simply by providing it for a short period of time. Finally, jobs may exist in the same occupation as the Supported Work experience. If employment opportunities at reasonable wage levels exist in that occupation, therefore, the job experience may increase future employment opportunities, but in the private sector.

The cases where host agencies have "rollover," or guaranteed placement, arrangements as part of the labor contracts are more likely to involve some measure of displacement. A plausible hypothesis is that

*Although it appears less likely, a similar argument can be made for outputs sold to the public sector at below market prices.

the job categories involve relatively high turnover in the existing labor market, and the job subsidy contracts allow for a screening, (at very low cost to the agency) of a relatively uncertain population, to determine who will be likely to stay at the job. The rollover arrangements with host organizations are also likely to have good prospects for post-program experience.

In these cases, the program may be absorbing some screening costs which the organization would have ordinarily incurred, but are happy to pass on to programs like Supported Work. There is no social benefit here but, to the extent that the program specializes in performing screening and training functions which individual employers do not have the incentive or ability to perform, then the program may create general benefits to society.

Entering the Nonunion Segment of a Unionized Market. Allocative efficiency will be improved if the avoidance of existing territory leads the programs to expand output markets which are in undersupply. This applies not only to the public sector but also to monopolies. When market power restricts supply or, equivalently, prices some customers out of the markets, then the created jobs can certainly provide valued outputs by expanding supply. Projects in the partially unionized industry are examples which fall in this category.

As in the case of public services, the challenge is to ensure that the expanded output is valued by society. In this case, however, charging below market prices or appealing to the special program status appear less likely to be an important element of the marketing strategy. Consequently, a market test is more likely to exist and ensure allocative efficiency. Post-program job opportunities in these sectors are likely

to be poor, however. The formal, unionized segment of the market restricts output by limiting union memberships; the informal, nonunion segment tends to be a low wage, high turnover submarket. In the first case, post-program jobs are not likely to be available. The in-program jobs survive as long as they do not threaten the stronger firms or labor groups, but when individuals leave the program they still will not have access to the rest of the market.* In the second case, the jobs are simply not attractive.

In summary, this type of public employment program faces a difficult task in encouraging operators to market output efficiently. Charging low prices or appealing to the special status of the program weakens the market test on the usefulness of output. Charging a market price and competing with private firms is difficult in any case, and may push the program into markets where post-program job opportunities are unattractive. Expanding output of undersupplied public services is allocatively efficient, and while many services may exist, identifying and negotiating their expansion with existing employees is no easy matter. Expanding output in a monopolized market is allocatively efficient, but future job opportunities are likely to be limited. Because of these environmental constraints, an innovative design is necessary if a public employment program is to be allocatively efficient.

*This may be less time during time of high and growing demand in the construction industry.

V. CONCLUSION

What implications can we draw from the early experience of the Supported Work demonstration? What remain as particularly important issues to which further research should be directed?

The most important thing we have already learned is that this scale of job creation is certainly technically feasible. Such a program can put workers with severe labor market difficulties to work.

The form which the job creation takes is extremely varied. The jobs range from redistributive public service jobs to revenue-producing manufacturing projects similar to private enterprise, from low-skilled maintenance jobs to moderately skilled clerical jobs, from completely in-house production operations to placements of single individuals in public agencies with minimal program support.

Although the direct job creation is thus feasible and varied, it is too early in the demonstration to evaluate its effectiveness. We have presented a framework for evaluating the economic efficiency of a public employment program. But we should reiterate that efficiency is neither the only nor necessarily the most important evaluation criterion--society may wish to run a public employment program because it redistributes income to the poor or because it appeals to the nation's work ethic. Nonetheless, it is an important criterion, especially when different programs designed to achieve the same objectives are being compared.

Having adopted this criterion, we have argued that job creation that is efficient in the economist's sense is likely to be difficult. The probable difficulty of efficient job creation follows from the observation that a job creation program must function within the existing environment. If there were substantial efficiency gains to be made by hiring target group members, why haven't existing institutions discovered them?

Lest we sound too pessimistic, we should stress that we do not believe that existing institutions have discovered all efficiency improvements--especially in the area of working with disadvantaged workers and providing useful public services. But creating such an employment program so that its benefits exceed its costs will require innovative design and implementation--discovery of special management and supervision techniques needed for organizing the production process with disadvantaged workers, ferreting out areas where existing resource allocation is inefficient, discovering new public services for which significant demand exists, and devoting careful thought to the link between the program work experience and future employment opportunities.

The process of innovation is extremely hard to routinize, however, and the diffusion of innovations is far from automatic. A public employment program is, therefore, very likely to have to face the sorts of difficult trade-offs we have elaborated in this paper.

The belief that the program is a significant social innovation, indeed, is what makes it worth spending considerable resources to

run the demonstration. But the skepticism concerning the ease of increasing economic efficiency is what makes it also necessary to spend considerable resources on a formal evaluation. The risks are, on the one hand, that program expansion will proceed solely on the basis of successful implementation and anecdotal evidence of success and, on the other hand, that premature evaluation will kill off especially innovative job creation strategies before they have sufficient time to prove themselves.

The really important policy issue and intellectual challenge is not the evaluation of existing programs but how such evaluation can guide the design of future programs.* How should a program be designed and organized so that the incentives and feedback mechanisms attract and reward strategies which achieve society's desired objectives and guide the program in the right direction?

We began our analysis by comparing the tasks of a program operator to those of a manager of a private firm. Economists have a well-developed theory which argues that, in the private sector, profit incentives and price signals provide a self-correcting mechanism which selects efficient strategies and kills off the others. But a public service employment program operates in a very different world.

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*The evaluation is designed to provide quantitative evidence on participants' post-program earnings gains (as well as other out-of-program benefits), quantitative evidence on the productive efficiency of a sample of work projects, and qualitative evidence on the allocative efficiency of those projects. Combining this evidence to explore the hypotheses presented here about trade-offs among objectives is more difficult than an overall evaluation, but we feel it is important to try.

There is uncertainty concerning the trade-offs between important objectives. The incentives--to increase program size, generate local funding, and avoid opposition--may push the program toward inefficient job creation strategies. Very few signals and feedback mechanisms exist, and it is not clear whether those that do exist signal movement in a desirable direction.

The analysis of these issues of design is a subject for another paper, but we can indicate the kinds of questions which might be addressed:

- If avoiding opposition is likely to push operators into areas where the output runs the risk of not being highly valued, what could signal the operator that it is not useful? What incentives would ensure that the operator heeds the signals? Are there standard operating procedures which could routinize the signals and incentives?
- If operators give too little attention to the productivity of work crews, what changes in incentives and information would encourage greater effort to improve productivity?
- If the link between during-program job experience and post-program job opportunities is poorly understood, what follow up information will help us learn about that link? What incentives can be created to lead operators to adapt their job creation strategies toward those types of work with greater future payoffs? If some participants drop out, are fired, or fail to apply, what wage and other incentives will ensure that those appropriate to the program enter, stay, and leave when they are job-ready? For example, can any

feasible evaluative mechanism or renumeration scheme be designed to incorporate turnover rates or quality of job placements?

- More generally, and most important, what mechanisms of communication are required to ensure that successful innovations diffuse to other programs?

The variety of job creation strategies, the variation in expected effectiveness, and the difficulty of the trade-offs among objectives make it likely that any public employment program will have considerable opportunity for improved performance. The variation provides an opportunity to learn what strategies are effective. The challenge is to obtain the information necessary to design signals and incentives so that the effective strategies survive and grow. Only then can we expect public employment to be able to live up to its promise.

APPENDIX A. CONCEPTUAL FRAMEWORK FOR EFFICIENCY EVALUATION*

For a conceptual framework to be useful in evaluating the economic efficiency of public employment programs it must achieve two objectives. First, it should provide a framework for measurement of efficiency by suggesting what variables should be measured. Second, it should be useful for analyzing the effect of alternative policies on economic efficiency, by identifying the factors which affect it.

Efficiency Criteria: Definitions of Productive and Allocative Efficiency

The evaluation criterion adopted in this appendix is economic efficiency. The benefit-cost ratio is our measure of economic efficiency and also the starting point for our analysis.[1] To simplify the presentation, we begin by considering small changes in output and ignoring changes in marginal costs and benefits and thus ignoring the welfare loss "triangles" and the distinction between marginal and average quantities, which are relatively unimportant in comparison to the other evaluation issues to be addressed. (The analysis could be modified to take these complications into account without significantly altering the framework.)

The benefit-cost ratio can be divided into three components:

$$\frac{b}{c} = \frac{e}{c} + \frac{v}{c} = \frac{e}{c} + \left(\frac{v}{c^s}\right) \cdot \left(\frac{c^s}{c}\right) \qquad (1)$$

where b represents combined program benefits per additional unit of output; c, the social cost of the program; e, the change in post-program

[1] A similar analysis could be done using the difference between benefits and costs.

* We are grateful to Lee Friedman and Robert Haveman for helpful comments on this appendix.

earnings;[1] v, the value of the output produced by the program; and c^s the cost of having the same output produced by an alternative supplier. Equation (1) is simply an identity which, through its three ratios, highlights three dimensions of program effectiveness. The first ratio, $\frac{e}{c}$, can be thought of as the effectiveness of the program in raising post-program earnings. The second and third ratios separate the effectiveness of the program in producing useful social output during the program, $\frac{v}{c}$, into two components--an "allocative efficiency" component, $\frac{v}{c^s}$, and a "productive efficiency" component, $\frac{c^s}{c}$.

Since these terms are used in different ways in the economics literature, a note of clarification is needed. By "productive efficiency" we simply mean the productivity of the public employment enterprise (as compared to alternative suppliers). By "allocative efficiency," we mean the usefulness of the output produced, regardless of how efficiently it is produced.

Put in terms of welfare economics, in order for the allocation of resources to be efficient (i.e., Pareto optimal) four conditions must be satisfied:

(1) engineering efficiency[2]

(2) efficient input mix[3]

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[1] For programs such as Supported Work, which are designed to reduce crime, drug dependence, welfare dependence, etc., additional benefits also exist. For purposes of this analysis, it can be thought of as including the change in all of these benefits.

[2] Whatever inputs are used, they must be combined to produce the maximum possible output.

[3] Technically, inputs must be allocated among producers so that total output cannot be increased by a reallocation among producers (i.e., marginal rates of technical substitution must be equal for all producers).

(3) efficient output mix[1]

(4) efficiency in exchange[2]

The first two conditions ensure that the economy is on the production possibilities frontier. Our concept of "productive efficiency" is meant to encompass both these aspects of efficiency, which is consistent with general usage of the term by economists. Our concept of "allocative efficiency" concerns the second two conditions--regardless of the degree of productive efficiency. This use of the term "allocative efficiency" varies from that of some authors, who use it to refer to all four conditions for efficiency, including engineering and productive efficiency; other authors use the more narrow definition we have adopted.[3]

The overall efficiency of the program in producing useful social output, as measured by the ratio of value of output to program cost, is simply the product of the two ratios, $\frac{v}{c}s$ and $\frac{c^s}{c}$, which we present as indicators of allocative and productive efficiency.

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[1] The outputs produced must be those desired by consumers (i.e., the marginal rate of substitution of consumers must equal the rate of product transformation).

[2] The output which is produced must be allocated among consumers so that no mutually beneficial trades exist (i.e., the consumers' marginal rates of substitution are all equal).

[3] Because the concept of efficiency is a general equilibrium concept but we are performing a partial equilibrium analysis, our distinction between productive and allocative efficiency is somewhat artificial, and the concepts do not correspond perfectly to the general equilibrium conditions. For example if the program simply employs unemployed workers, freeing displaced workers to produce output elsewhere in the economy and thereby shifting out the production possibilities frontier, then overall efficiency is increased. Most economists would think of that as an increase in productive efficiency, however, whereas our partial equilibrium analysis would treat it as an increase in allocative efficiency.

In the literature on public sector productivity a similar distinction is made using the terms "efficiency" and "effectiveness" where we use "productive efficiency" and "allocative efficiency" respectively. See, for example J.P. Ross and Jesse Burkhead, Productivity in the Local Government Sector, Lexington, 1974, especially chapters 3 and 4.

Productive Efficiency

Many measures of productivity are used in the economics literature--total factor productivity and labor productivity under various definitions. Our measure is one of total factor productivity, the ratio of the cost of alternative suppliers, c^s, to the cost of the public employment program, $\frac{c^s}{c}$. The higher the ratio, the higher the productive efficiency of the program.[1]

Although there are numerous specific measurement issues (discussed in Appendix B), the general strategy for measuring productive efficiency is to ask what price alternative suppliers would charge to provide the same service. This "supply price," p^s, which is typically the prevailing market price, can then be adjusted if there is reason to believe that the price does not reflect the (marginal) social cost of the output. The presumption is that the price charged in competitive markets equals the social cost of producing the output. But in cases of monopoly, unions, or significant externalities, an adjustment to supply price is appropriate, at least in principle. The following identity provides a framework for measuring productive efficiency:

$$\frac{c^s}{c} = \left(\frac{c^s}{p^s}\right) \cdot \left(\frac{p^s}{c}\right). \qquad (2)$$

In many cases, the price will equal the social cost of alternative supply; where it does not, crude estimates of the externalities or monopoly waste could be made or sensitivity tests could be performed.

Finally, the cost of alternative supply is intended to be the cost at full employment so that the measure of productivity is not dependent on the level of economic activity.

In short, the index of productive efficiency is useful for policy assessments of public employment, is relatively straightforward theoretically,

[1] In practice, it is possible to calculate several measures of productivity from the same data.

and contains a clear set of questions to be answered for empirical estimation.

Allocative Efficiency

Our index of allocative efficiency, $\frac{v}{c^s}$, has as its denominator the cost of alternative supply discussed above. The numerator, the value of output to society, however, is much more difficult to analyze theoretically, to say nothing of measuring it empirically. Nonetheless, we can develop a simple identity which shows what factors affect allocative efficiency. This identity will not provide a method for obtaining quantitative estimates of value of output, but it will provide a framework for collecting qualitative information on those factors that affect it, and thus affect allocative efficiency.

1. The Competitive Market Case. While public employment programs will not typically sell output in competitive markets, the simple competitive case serves as the point of departure for the more complicated cases.

Our fundamental assumption is that consumers' willingness to pay represents the value of output to society. Thus, we begin with the consumers' demand for the output, since the price they are willing to pay, p^d, represents the value of output to them. If the program sells a small amount of additional output at the prevailing prices, in a perfectly competitive market, then the value of output, v, will equal that demand price. This will in turn be equal to project revenue, r. Thus, project revenue is a good measure of value of output to society[1] and one which can easily be measured.

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[1] Assuming the market is in equilibrium, revenue will also equal the supply price, so that revenue can be used to measure supply price and hence be used to calculate productive efficiency. The index of allocative efficiency we have constructed, v/c^s, will therefore equal one in the competitive case (provided the social cost of alternative supply equals its price) because $v=p^d=r=p^s=c^s$.

If, instead of producing additional output, the program displaces other producers, the value of output is the same[1] as in the expanded output case--as the following argument will show. If the entire economy is a frictionless competitive economy at full employment, displaced resources will immediately be reemployed producing useful output elsewhere in the economy. The value of the output they produce is their "opportunity cost," c^0. But in a competitive economy, opportunity cost equals supply price, which equals demand price--and the value of output is the same as it was in the output expansion case. These cases are shown in figure A1.

In short, in a perfectly competitive, full employment economy, the value of output to society, consumers' willingness to pay, revenue actually paid, the price charged by alternative suppliers, and the opportunity cost of the resources used by alternative suppliers are all equal. But public employment programs do not typically produce output for sale in competitive markets. If they did there would be little concern about low value of output; advocates would be able to argue that the "market test" would ensure the usefulness of the output produced. It is precisely because public employment programs do not produce in competitive markets that critics question the value of output. It is also because the output is not sold in competitive markets that the analysis becomes difficult. Once we leave the world of a perfectly competitive, full employment economy, value of output, revenue, supply price, and opportunity cost need no longer be equal, and there is no longer any simple way to assess the value of output.

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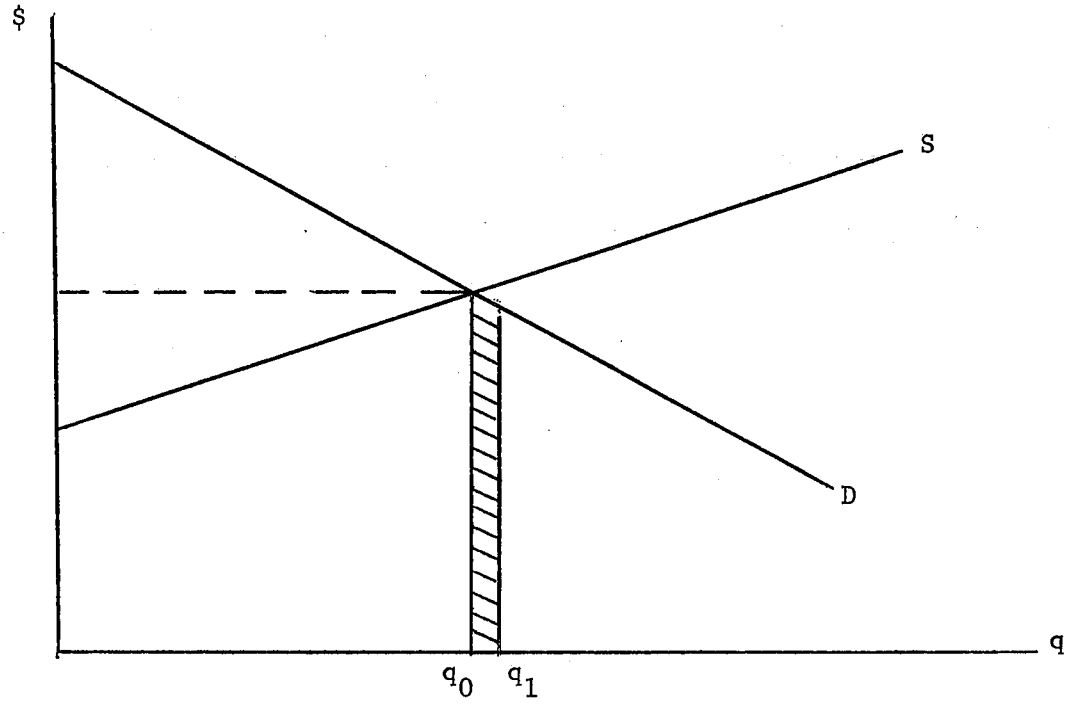
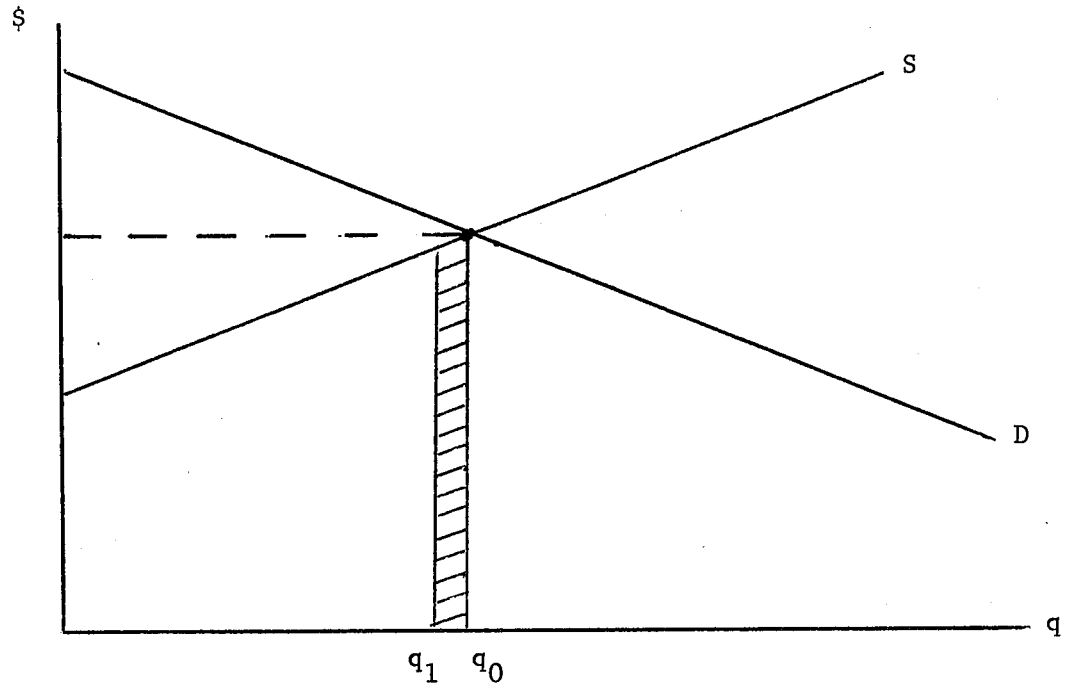
[1] Recall that we are ignoring welfare loss triangles.

$V = p^d = r = p^s$



a. Expanded Output

$V = C^o = P^s = r$



b. Displaced Resources

Figure A1: Value of Output in Case of a Perfectly Competitive Market Economy.

2. Departure from the Perfectly Competitive Case. The analysis of cases which depart from the perfectly competitive market is more complicated because of the many ways departures from perfect competition can take place:

- Revenue may not represent consumers willingness to pay[1]
- External benefits may exist[2]
- Opportunity cost may not equal the cost of alternative supply[3]

Analysis in the more realistic noncompetitive market world requires consideration of a fair number of cases. Because the value of output to society depends upon whether output in a sector is increased by the program or whether the program simply displaces existing producers, we perform our analysis by examining these two extreme cases first. The intermediate case of part output expansion and part displacement is then a simple combination of the two. Because supply price and project revenue are both measurable, they will be emphasized in the analysis.

(a) The case of expanded output. In the case of expanded output, the value of output depends on the consumers'[4] willingness to pay for the output, the extent of altruism, and the extent of

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[1] For example, federal subsidies may be used to purchase services for poor individuals.

[2] For example, the whole neighborhood may be improved as the result of rehabilitating a few houses on the block.

[3] Resources are not reemployed immediately and without adjustment cost, especially when unemployment is high.

[4] By "consumers" we mean the recipients of the output; they may differ from the contracting organization which pays for the services.

external benefits.[1] We use the term demand price, p^d, to mean the amount the consumers of the output would be willing to pay for the service. This is the price on the market demand curve for the output. It need not be equal to the market price prior to job creation or to the price paid to the public employment program.

The price which beneficiaries would be willing to pay for additional output need not equal the prevailing market price because of existing allocative inefficiencies. For example, a failure of the political process might mean that too few public services are provided, so that the benefits of additional services would exceed their cost[2] (i.e., p^d would exceed p^s by some amount). By increasing output, public employment would improve the allocative efficiency of such a sector.

Neither does the amount of money paid to the public employment program for the output necessarily equal the amount the recipients would be willing to pay for the service. A public employment program would undoubtedly require a subsidy from the federal government or other organization. This susbidy would permit the program to charge a price less than people were willing to pay--or even to give services away.[3] Another reason

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[1] Here we use "external benefits" to refer only to the externalities associated with consuming the output, not to the other program benefits such as increased post-program earnings, reduced welfare payments, etc.

[2] Advocates of public service employment often argue that this is the case and that a public employment program would help to rectify this public inefficiency.

[3] An important practical example which fits in this category involves CETA funds. These funds are restricted to payments to particular target groups--presumably expressing a national "altruism" in support of redistribution to those groups. The local government receiving such restricted funds will be willing to pay more for services provided by target group members than they would for the same services provided by alternative, non-target group suppliers (provided the restriction is binding).

project revenue may not represent willingness to pay arises from consumers' desire to redistribute income. Altruistic buyers may be willing to pay more for output produced by disadvantaged workers than they would for the same output produced by an ordinary supplier. Thus, the amount they are willing to pay can be thought of as including two components, a part for the output per se and a part to support the overall program and its concept.[1] These cases are depicted in Figure A2, where $\hat{D}$ represents the demand for output produced by public employees and D the demand for output produced by alternative suppliers; $\hat{p}^d$ and p^d the corresponding demand prices; and r the project revenue, i.e., the amount actually paid. The figure illustrates that revenue, willingness to pay, and supply price need not be equal. In addition, the figure depicts the case where consumers are willing to pay more to have the work performed by public employees. This benefit is different in kind from the value of consuming the output per se. In subsequent discussions we will not include this additional benefit of redistribution as part of "value of output."[2]

Another kind of "additional benefit" of expanding output includes externalities as conventionally defined. For example, when public employees rehabilitate several houses on a block, the whole neighborhood benefits. These benefits should be added to those of the consumers. (Consumers in

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[1] The efficiency benefits of redistribution are often lumped together with other externalities. We feel the separation of this externality from others is useful.

[2] Altruism may also exist because the recipients of the output are disadvantaged. When the organization paying for the output is different from the recipient, this benefit may be reflected in project revenue. In any case, this additional benefit is also excluded from v in our analysis.

Our exclusion of the efficiency benefits of redistribution should not be interpreted to mean that these benefits do not exist or are unimportant. Rather, we feel that the assessment of the value of output produced is better done using the narrower definition of efficiency. In deciding whether to run a public employment program, however, the benefits should be counted; indeed, for most voters, they may and perhaps should be the overriding concern.

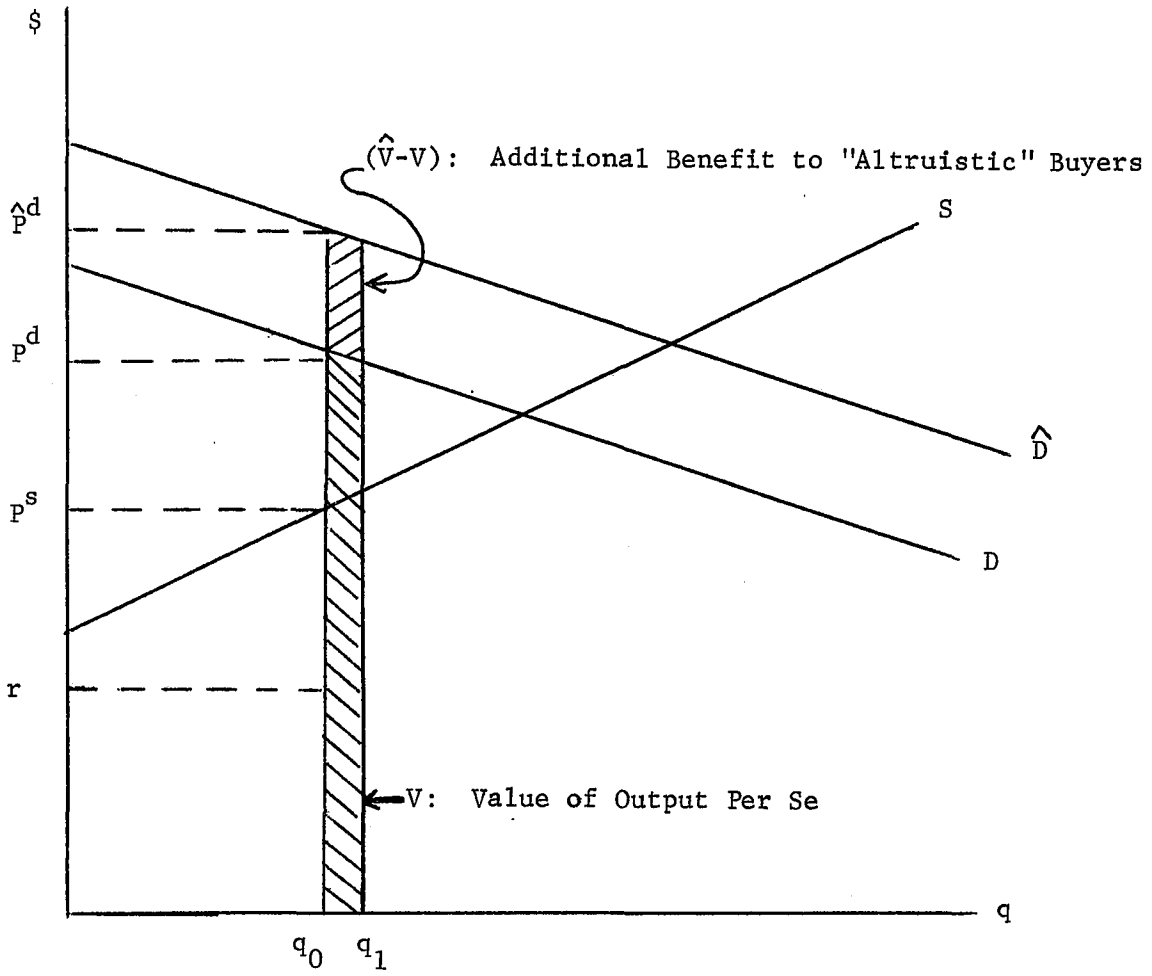

Figure A2: Value of Output in Case of Expanded Output, Altruism, Initial Allocative Inefficiency and Revenue Unequal to Willingness to Pay.

this example are the residents of the rehabilitated houses.) Thus, $v = p^d + x$, where x represents external benefits per unit output.

Since revenue, r, is easily observed, it can sometimes be used to place bounds on the value of output, using the following identity:

$$\frac{v}{c^s} = \frac{x}{c^s} + \left(\frac{p^d}{\hat{p}^d}\right) \cdot \left(\frac{\hat{p}^d}{r}\right) \cdot \left(\frac{r}{c^s}\right). \tag{3}$$

To use revenue to place bounds on value of output we need to know:

(a) whether the program is charging the maximum price it can get. (Does $\frac{\hat{p}^d}{r} = 1$?)

(b) whether the consumers are paying for theservice and whether their "altruism" is a significant factor in their decision to buy (Does $\frac{p^d}{\hat{p}^d} = 1$?)

(c) whether there are significant external benefits? (Is $\frac{x}{c^s} > 0$?)

Clearly, accurate quantitative estimates of $\frac{\hat{p}^d}{r}$, $\frac{p^d}{\hat{p}^d}$, and $\frac{X}{c^s}$ are unattainable, but qualitative information on each can be obtained and used to place rough bounds on them.

An alternative way of placing a bound on the value of output is to assume that the sector was allocatively efficient prior to the expansion of output. Then the amount consumers would be willing to pay for additional output can be no more than the supply price ($p^d \leq p^s$). Thus, an estimate is given by

$$v = X + p^s. \tag{4}$$

For all the reasons discussed above, however, this estimate may exceed the actual value of output by a large amount. When revenue is much lower than supply price, this estimate is especially likely to be too high because

of the absence of a market test.[1] For this reason, and because it does not allow for the possibility of an initial undersupply of public services, we do not believe the estimate of value given by equation (4) to be very useful.

(b) The case of displaced resources. At the other extreme from output expansion is the case where total sector output remains unchanged so that the public employment output displaces some existing producers. There are no benefits to consumers in that sector because the quantity of output consumed does not change. The value of output depends upon what happens in other sectors of the economy. If the displaced resources are unemployed, then no additional output is produced and the value of output is zero. If the displaced resources are immediately employed producing useful output in some other sector, then the value of output equals the value of their marginal product in that sector. In other words, the value of output is given by the opportunity cost of the displaced resources, c^o, and $\frac{v}{c^s} = \frac{c^o}{c^s}$.

If this ratio looks suspect, it should. Assuming that markets are working well, it is literally the ratio of the opportunity cost to itself. But recall that in order to have measures of productive efficiency which were independent of the business cycle, we defined c^s to be the social cost

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[1] It should be viewed as an upperbound estimate of value of output also because it assumes that the expanded output is distributed among possible consumers in the most efficient way possible. While this can be assumed for some institutional arrangements (for example, if program output is sold in a competitive market), it need not be true for others. For example, if output is given away free of charge, it need not be given to those who would be most willing to pay for it. Indeed, a program with income redistribution objectives might intentionally not do so.

of producing a unit of output when the economy is at full employment. Thus, $\underline{c}^o$ equals one by definition if the economy is at full employment. But $\underline{c}^s$ below full employment it will be less than one and it will depend on the probability and duration of unemployment as compared to that at full employment.[1] Thus, our index of allocative efficiency depends on the unemployment rate but our index of productive efficiency does not (except to the extent that the opportunity cost of participants varies with the unemployment rate).

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[1] In fact, the issue is more complicated than this simple partial equilibrium model suggests. Analysis of the benefits of displacing resources depends upon the model being used and the alternatives being compared. The analysis properly requires an economy-wide model, either a general equilibrium or a macroeconomic framework.

A general equilibrium model would emphasize the importance of adjustment costs. If there are substantial adjustment costs in the economy, then when a public employment program displaces resources, the value of output which will be produced by these displaced resources is less than the cost of alternative supply by the amount of these adjustment costs. A general equilibrium tally of net additional adjustment costs due to the program is needed, at least in principle.

A macroeconomic model would emphasize the importance of specifying the policy which would be pursued as an alternative to public employment for this reason. If aggregate demand is held constant, then, to a first approximation, creating a public employment job will mean there is one less job somewhere else in the economy. The value of output produced by displaced resources (and the resources displaced by them, etc.) is zero. Furthermore, even the value of output expansion is offset by a loss in output elsewhere in the economy if total aggregate demand is held constant; in other words, all public job creation causes offsetting displacement under this extreme assumption. We do not find this macroeconomic perspective particularly useful for the analysis of efficiency.

(c) The mixed case of output expansion and displacement. Having analyzed the extreme cases, the general case is simple to analyze because the value of output is the sum of (1) the value for the increased output and (2) the value for the displaced output. Our index of allocative efficiency is given by the following identity, which is simply a "weighted average" of the two extreme expressions where the weights depend on the fraction of output which causes displacement,

$$\frac{v}{c^s} = \lambda \frac{c^o}{c^s} + (1 - \lambda)\left[\frac{x}{c^s} + \frac{p^d}{c^s}\right] \tag{5}$$

where

$$\frac{p^d}{c^s} = \left(\frac{p^d}{\hat{p}^d}\right) \cdot \left(\frac{\hat{p}^d}{r}\right) \cdot \left(\frac{r}{c^s}\right)$$

and the symbols are defined as

v: value of output to society (including externalities)

c^s: the social cost which would be incurred at full employment if an alternative supplier had produced the same output

λ: the fraction of output which would have been consumed in the absence of the program

c^o: the opportunity cost of displaced resources (whether or not at full employment)

p^d: the (maximum) price the consumers (i.e. recipients of the output) would be willing to pay if an alternative supplier produced it

$\hat{p}^d$: the (maximum) price the consumers would be willing to pay given that it is produced by the program

r: the actual price (i.e. revenue)

x: the external benefits of producing the output (excluding the benefits of income redistribution)

Implications for the Allocative Efficiency of Alternative Marketing Strategies

We conclude from the preceding analysis, summarized by equation (5), that the allocative efficiency of the created jobs depends upon:

- the extent of displacement, λ,
- the allocative efficiency in the sector prior to job creation, $\frac{p^d}{c^s}$,
- the pricing policy of the program, $\frac{r}{c^s}$,
- the probability and duration of unemployment in the sector relative to full employment, $\frac{c^o}{c^s}$,
- the extent of altruism, $\frac{p^d}{\hat{p}^d}$,
- the extent to which revenue represents willingness to pay, $\frac{\hat{p}^d}{r}$
- the extent of externalities, x.

From this we can derive a number of conclusions about the probable allocative efficiency of alternative marketing strategies. Marketing strategies differ with respect to pricing policy, market (i.e. industry), and extent of appeal to altruism.

Obviously, the amount of displacement is an important determinant of allocative efficiency, depending upon pricing policy, extent of altruism, and the time period of analysis.

When consumers pay only for the output and not for altruism ($\hat{p}^d = p^d$), then displacement must be 100 percent ($\lambda = 1$), if the program charges a market price ($r = p^s$). This is true in both the short and long run. (This case was depicted in Figure A1b). If the program charges a price below the market ($r < p^s$), then output is expanded and producers may or may not be displaced in the short run, depending on the elasticity of

demand. In the long run, displacement is likely to increase as consumers switch from high price private producers to the public program, and the program takes over a greater and greater share of the market.

When the program succeeds in appealing to its special status as a redistribution and training program as a means of marketing its output,[1] output will be expanded regardless of pricing policy as shown in Figure A3. The market output prior to the program is q_0. If the program charges a market price ($r_1 = p^s$), output is only expanded by the altruism component of demand (to q_1). By charging a price below the market ($r_2 < p^s$), output can be expanded further (to q_2). Displacement may occur in either case, but it will always be smaller when altruism is important, holding other things equal. In the long run, we expect displacement to increase both because altruism may be difficult to sustain and because adjustments occur over time.

Because displaced resources have a greater "opportunity benefit," the higher the level of economic activity, varying marketing strategies with the business cycle may improve allocative efficiency.[2] Output expansion will be more allocatively efficient relative to displacement during times of full employment.

When output is expanded, allocative efficiency depends upon the extent to which the allocation of resources in the sector was efficient prior to the entry of the program. If the benefits to consumers of expanding output exceed the marginal cost of expanding output, if $p^d > c^s$, then the increase in allocative efficiency will be relatively

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[1] Note that altruism can and often will exist even though the program makes no special appeal for it.

[2] This is in sharp contrast to many government programs whose efficiency increases during recessions because the benefits remain constant and the opportunity cost of labor decreases. While it is possible that the opportunity cost of participants decreases (an effect which would appear in our productivity index) enough to offset the loss in value of output, because the opportunity cost of participants is low to begin with, we consider this unlikely unless the recession changes the composition of participants so their opportunity cost increases.

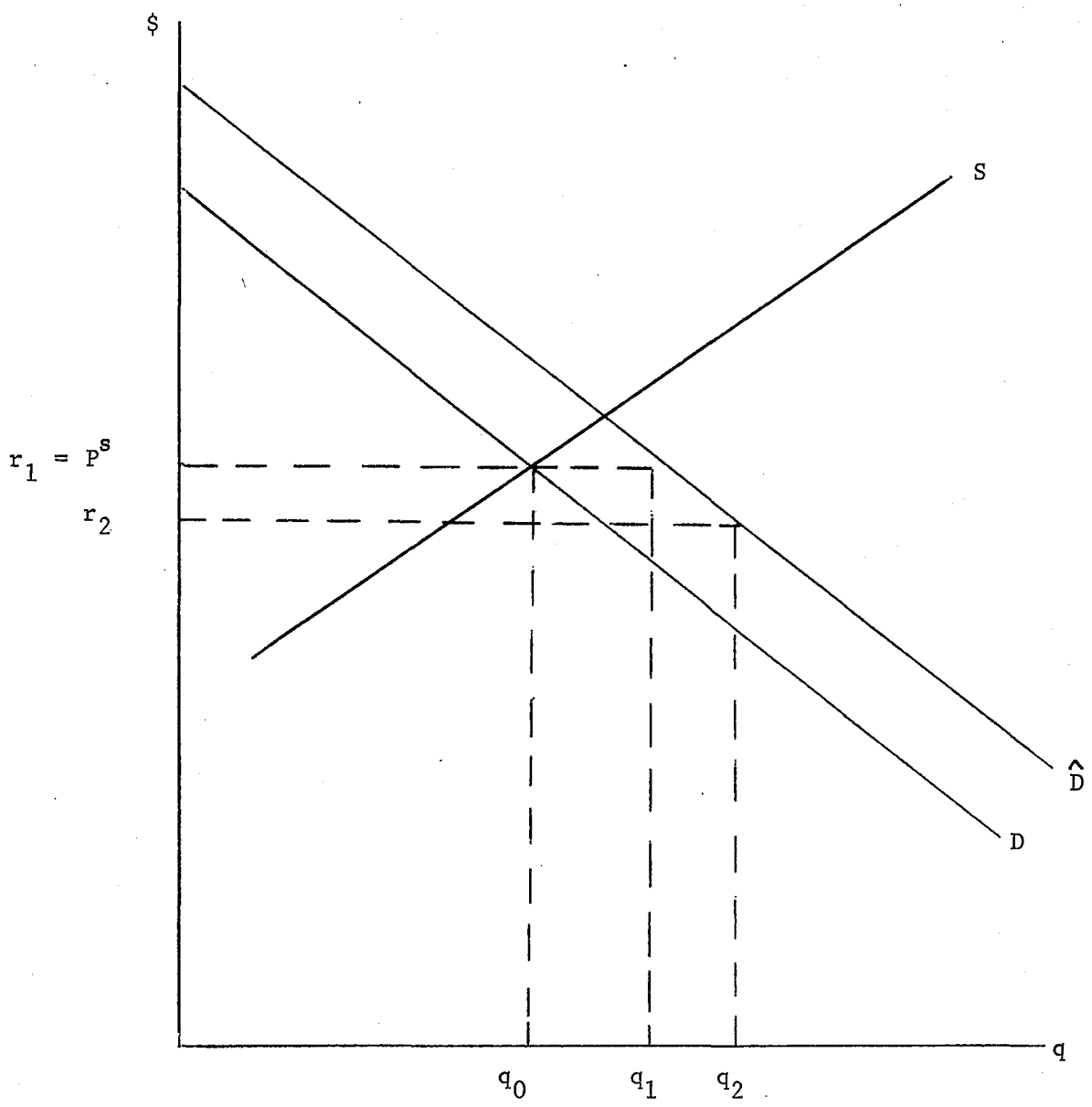

Figure A3: Market Equilibrium with and without Altruism.

high. In practice this means entering markets which are monopolized or unionized, identifying "needed public services" which are not being provided, or creating a new service for which there is strong demand (i.e., creating a "product innovation").

The extent to which the sale of output is subject to a market test also affects the allocative efficiency of program output. The market test is weakened if the program charges a price below the market price, (if $r < p^s$), or if it appeals to the altruism of buyers, (if $\hat{p}^d > p^d$).

Although it may be necessary to do these things in order to create jobs, the absence of a market test creates the possibility that the output will not be highly valued by society, other things equal.

In summary, our analysis concludes that to increase allocative efficiency, programs should enter sectors where the initial output is inefficiently small and subject their output to a market test (by charging a market price and not appealing to altruism). Whether the program should seek to expand output rather than displace resources depends upon the probability of reemployment of the displaced resources. If it is low, displacement becomes less attractive relative to output expansion.

APPENDIX B. OVERVIEW OF PROCEDURES FOR ESTIMATING SUPPLY PRICE

Our measurement procedures for estimating the "supply price" defined in Appendix A are relatively straightforward. We begin with a site interview about the history of the project, the customer, the financing arrangements, and the production process. From this information, we attempt to determine whether the output is sold in a competitive market and, if not, which of the many possible alternatives applies to this project. A few basic principles underlie our strategy for estimating supply prices.

Some Basic Principles

We attempt to follow several simple, but important principles for all value of output studies:

Distinguish outputs from inputs. Our objective is to measure the value of output of the Supported Work project as opposed to the cost of inputs. The value of output will enter the benefit side of the benefit-cost analysis and the cost of inputs will enter the cost side of the calculations. It is important, therefore, to maintain a clear distinction between what is produced and the resources required to produce it. To the extent possible, we attempt to base value of output estimates on measurements which are independent of inputs.

Maintain a clear project definition. In order to match estimates of value of output to the cost of inputs, a project must be well-defined with respect to outputs produced and time period covered. To avoid the

possibility of associating too many or too few inputs with given outputs, entire projects are valued; to the extent possible, therefore, valuing parts of projects is avoided.

Minimize observation effects. Since knowledge that workers are being evaluated can obviously affect their behavior, an effort is made to take measurements without the knowledge of program staff. Although blind observation is seldom possible, efforts are made to minimize observation effects.

Determine the appropriateness and accuracy of program records. While the data available on program operations is much better for this program than is typical for such programs, our experience suggests that program records cannot always be used without adjustment. It is not that program operators wish to deceive but simply that their data needs are different and less stringent than those of research. Consequently, records must be checked for appropriateness and accuracy.

While all such studies attempt to adhere to these basic principles, the strategy for estimating supply price for market projects differs from that for nonmarket projects.

Competitive Market Outputs

If the project is selling output in a competitive market at the prevailing market price and quality, then the price actually paid equals the price which would have been paid to an alternative supplier, so that project revenue forms the basis of the estimate. Therefore, we begin with a survey of market prices and performance to determine whether the program is charging market prices for the customary levels of performance.

For discrete projects, i.e. projects with a definite beginning and end, we then estimate project revenue, cost, and supported worker time devoted to the project after it is completed. For continuous projects, we pick two points in time between which we estimate revenue, costs, and supported worker time. Using program records, we determine whether the revenue, cost and labor time information is accurate and make corrections where they are needed.

While this sounds simple, it can be a time-consuming task because of the state of records. In the case of continuous projects, making sure that revenues, costs, and labor time all correspond to the same period can be a considerable job. Our limited experience therefore suggests that although theoretically straightforward, the value of output of competitive market projects is considerably more difficult to measure than we had hoped.

Outputs Not Sold in Competitive Markets

Outputs which are not sold in competitive markets require a different estimation strategy. As discussed above, the basic question to be answered for these outputs, which are primarily public sector outputs, is what cost would have been incurred if an alternative producer had produced the same output. The strategy used is that developed by Lee Friedman in his evaluation of the Wildcat demonstration (the Vera pilot study).[1]

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[1] See Lee S. Friedman, "An Interim Evaluation of the Supported Work Experiment," Policy Analysis, Spring, 1977.

Our usual assumption is that this cost is equal to the price which would be charged by alternative suppliers. We have adopted two strategies for estimating this supply price, using both in most cases of nonmarket outputs.

1. Production standards method. We begin the production standards method by talking to individuals who produce the output in either the private or the public sector. Our experience has been that both public and private suppliers have faced the problem of making estimates of a market price, although in different contexts. Private suppliers need to estimate the price of their output in order to make bids for contracts. Public sector suppliers have often attempted to estimate their cost in order to compare them to private sector bids or to provide production targets for workers. A method of estimating the cost sometimes used by both the private and public sectors appears to be standard across different types of service. It consists of seven steps:

(a.) Measure the dimensions of the tasks to be performed.

(b.) Using production standards, multiply the number of units of output to be produced by the time it takes to produce each unit to obtain an estimate of the total time requirement.

(c.) Estimate the cost per unit time for labor and fringe benefits and multiply by the total time to estimate total labor cost.

(d.) Using production standards, estimate the amount of materials needed for each task.

(e.) Estimate the cost of materials based on their prices.

(f.) Mark up total cost by a fixed factor to include equipment, overhead, profit, and other costs of doing business.

(g.) Assess the quality of the job and adjust the costs for a quality differential. (This final step is one which is not performed in general by either private or public sector suppliers, but is necessary for purposes of evaluation.)

The production standards required to perform steps (b) and (d) are essential to the technique. While they are often difficult to locate, we were surprised to learn that production standards were available, often in published form, for every sector we have examined to date. Thus, while it is subject to several disadvantages, the production standards method seems to be a feasible method of making supply side estimates of the value of output.

2. Independent estimates. As an alternative to the production standards approach, we have often attempted to obtain an independent estimate from a private contractor or public agency in the area. Just as an individual purchasing a service might ask for estimates, we have hired private contractors to supply such an estimate. In addition to obtaining the estimate of the supply price, we have also asked for an explanation of the estimation technique used and for an assessment of the quality of work performed. The independent estimate is an alternative estimation method. When both methods are used they provide a check on each other. Where they are different, the two estimates also provide an indication of the variance in the supply price of the output.

Some Real-World Complexities

Throughout this paper we have been writing as if there were a single market price for output which we simply have to go out and measure. In reality the market place is, of course, messier. Instead of a single price for output, there is a distribution of prices which has a rather high variance, at least in the markets we have observed. In addition, there is considerable variance in performance for outputs sold at the same price.

Some markets, building maintenance and construction for example, are segmented into a "formal" and an "informal" part. The formal segment does larger jobs, provides higher quality performance, and deals with large well-established customers. The informal segment does the smaller, lower quality jobs and is not unionized. Within each segment there is a distribution of prices and performance, but there appears to be surprisingly little competition between the two segments.

In a number of the competitive sectors, turnover of firms is quite high. In building maintenance, for example, many small establishments enter the market by charging a low price--whether simply to get some initial jobs or out of ignorance is not clear. After some time, they are forced to default on their contracts either implicitly (by reducing service) or explicitly (by quitting the job or getting fired).

All of these factors combine to create an underlying variance in market prices and performance which makes estimation difficult. Not only are there the expected measurement error and sampling error resulting from project selection, but there is also sampling error in the selection of

independent estimators to estimate the market price. Thus, the estimation of supply price is more difficult and more uncertain both than we had anticipated and than we have made it appear here.