# Measuring the Cost and Accomplishments of Capital Subsidies

## The Case of Rural UDAG Grants

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## Measuring the Cost and Accomplishments of Credit Subsidies: The Case of Rural UDAG Grants

The provision of low-interest loans to private for-profit firms continues to be a major tool for economic development in the U.S. Loan programs are designed to attract business establishments to particular locations, encourage the startup of new businesses, or retain exising businesses.

Credit subsidies include the making of loans at below market interest rates, often with more lenient repayment schedules than a firm would be able to obtain in the private capital market. These programs may also include government assumption of a portion of interest payments on private sector loans or guarantees on private loans.

The purpose of this paper is to review some of the measurement problems encountered in quantifying the costs and accomplishments of interest subsidy programs for economic development, to lay out a methodology for evaluating such programs, and to apply this methodology to the rural component of the Urban Development Action Grant program, a federal capital subsidy program. This paper is also intended to provide a comparison point for future evaluations. The methodology outlined here is limited to government-provided subsidized loans, government subsidies on private loans, and outright grants, rather than government guaranteed loans. In the case of guaranteed loans, the subsidy arises when the firm defaults and government must repay the loan. Measurement of these costs

differs substantially from the interest subsidy case and is a topic for other research. In addition, this methodology is not appropriate for evaluating Industrial Revenue Bonds, for reasons that will become clearer below.

Low interest loan programs are widely used. For example, a 1983 Urban Institute review of state business incentives found that 20 states offered direct low-interest loans to private firms. The survey concluded that such loans were the most frequently used economic development incentive after Industrial Revenue Bonds. Interest subsidies on private loans are less common. For example, Urban Institute researchers found that only one state paid a portion of firms' interest on private loans.[1]

At the Federal level, credit subsidy programs have been administered by the U.S. Department of Housing and Urban Development (HUD), though the Urban Development Action Grant Program (UDAG). This program has funded nearly 3,000 projects and spent $4.67 Billion to date. The UDAG Program lost appropriations in Fiscal year 1989 and is now operating on funds recovered from earlier years. About 60 percent of UDAG funds have been allocated in the form of low interest loans to private businesses. Other federal programs that currently make low- interest business loans include the Economic Development Administrations Revolving Loan Fund, HUD's Community Development Block Grant program and the

[1] National Association of State Development Agencies, National Council for Economic Development, and The Urban Institute, 1983.

Small Business Administration's business loans for the handicapped.

In spite of the importance of low-interest loan programs to state and federal economic development portfolios, there has been relatively little research on their overall cost effectiveness, their accomplishments relative to other forms of development assistance, or the factors that make one interest subsidy program more effective than another.

Measurement Problems

Attempts to evaluate the cost of capital subsidy programs encounter a number of troubling methodological obstacles. The first difficulty arises in measuring the true economic costs of the subsidy. When the government provides a loan at below market rates, it is difficult to determine the interest rate a firm would have paid for that capital on the open market. This difficulty is compounded because in many cases program participants do not have access to private capital at all.

Additional ambiguities arise in the selection of the appropriate discount rate to use in calculating the present value of a stream of future costs or benefits. Selection of the correct discount rate is complicated by the fact that different discount rates are appropriate when the capital subsidy program is funded by tax revenues versus public borrowing. When the subsidy is funded through public borrowing the opportunity cost of borrowed funds, and thus the appropriate discount rate, is near the market rate of interest, since government borrowing implies foregone

private investment. When the program is funded through tax revenues, some portion of the revenue is raised through reduced consumption on the part of taxpayers. The opportunity cost of foregone consumption has been found to be much lower than the market rate of interest, with estimates of about 3 percent (Tresch 1981).

Another set of complications arise when calculating the accomplishments of a capital subsidy program. First, we can never be sure how many how many jobs a firm would have created in the absence of assistance. If, for example, the firm would have made the same investment decision in the same location without the government subsidy, government funds merely displaced private funds and the subsidy is not responsible for the jobs created by the firm.

Second, difficulties arise in determining how long after the plant opens to calculate the number of jobs created. If job totals are taken immediately after the first round of hiring, subsequent employment expansions are overlooked, underestimating the number of new jobs. An early counting of jobs can, in other cases, overestimate job creation where plants fail shortly after opening. Later job counts have the advantage of accounting for plant expansions and failures, but at least two disadvantages. First, the longer the period between the business startup and job count, the more difficult it is to separate the employment effects of post-subsidy investments and macroeconomic conditions from the employment effects of the subsidy. Second, the longer the delay,

the more likely individuals involved with the site location or expansion decision will leave the firm, making interviews with key actors difficult.

A third area of measurement difficulties is in measuring the second round employment effects in the firms suppliers or in residentiary services. Finally, there is always the question of the quality of the jobs created. In spite of these measurement difficulties, interest subsidy programs are so widespread and important in federal, state, and local economic development strategies that an attempt at estimation must be made, even if the resultant measure can not be precise.

Previous Research

Quantitative evaluations of capital subsidy programs have included benefit-cost studies of state programs, such as those by Rinehart (1963), Sazama (1970), Hellman, Wassail, and Falk (1976), and Mazie and Ledebur (1982), or cost per job estimates, such as that by Swass and Seigel (1987). These researchers have adopted different approaches to measuring both program costs and benefits.

To measure costs, Sazama and Hellman, Wassail, and Falk calculated the present value of annual loan outlays minus annual loan repayments plus annual administrative costs. The shortcoming of this approach is that it underestimates the cost of loan programs when outlays, which occur up-front, are included in the analysis but repayments of those loans, which occur outside the time frame of the study, are excluded. A second shortcoming with

the cost/benefit approach is that there is little guidance as to which discount rate to select. To cover all possibilities, both Sazama and Hellman et al. tested discount rates ranging from 2 percent to 12 percent. Kwass and Seigel's study of the U.S. Department of Economic Development's loan program used the total loan amount to measure costs. This approach overestimates the true costs of the program to government because much of the loan is repaid.

These studies also adopted different strategies for measuring the effectiveness of credit subsidies. Rinehart assumed that all firms in his sample located in the municipality because of the subsidy. Both Sazama and Kwass and Seigel interviewed plant managers and owners and asked whether the subsidy was crucial to the firms investment decision and then only included the income or jobs generated by those firms where the loan program was a crucial factor.

Hellman et al. measured program benefits by running regressions of total state investment in manufacturing against state low-interest loan outlays, the interest rate, and the change in value added. They then multiplied the coefficient on loan outlays, times the value of loan outlays and a regional multiplier to yield a measure of total new investment due to state loan programs. This approach overestimates the impact of low-interest loans on private investment because the coefficient on loans captures the impact of all correlated variables not included in the regression equation. Sazama measured benefits as the wages and

profits generated by firms for whom the low-interest loan was crucial to the investment decision. Both Hellman et. al. and Sazama overestimate benefits because they ignore income losses elsewhere in the state economy since state funds were diverted from other projects to low interest loan programs. Mazie and Ledebur measure benefits as the financial gain to the firm. Kwass and Siegel measured benefits by counting the number of jobs created by benefitting firms.

Using the benefit-cost approach, Sazama concluded that state low interest loan programs in five Northeastern states were cost-effective. Hellman, et. al. concluded low-interest loan programs were cost-effective in Pennsylvania, but not in Connecticut. Kwass and Seigel found that the Revolving Loan Program cost an estimated $4,726 per job.

## Measurement of Project Costs: Calculation of Capital Subsidy Value[2]

The approach described here is an improvement over other empirical work because it (1) measures the full government cost inherent in each low interest loan and (2) provides a justification for the selected discount rate.

Projects that involve a below-market rate loan to a private firm can be thought of as containing (1) a pure loan component

[2] This section draws on Wattleworth, Michael (1988). For an elaboration on many of these points, see this paper.

reflecting the government's role as a financial intermediary and (2) a pure grant component, reflecting the government's role as a redistributional agent. In its role as a financial intermediary the government is acting much the way a bank would, by borrowing money from the general public and lending the funds to a private firm. The pure grant component of the loan depends upon the gap between the terms of a market loan and the terms of the subsidized loan, where terms include the interest rate, repayment period, and length of a grace period before repayment begins. The larger the gap between the terms of a market loan and the subsidized loan, the greater the grant component.

The pure grant component is made up of an explicit and implicit subsidy. The explicit portion of the subsidy is the difference between the government's costs of funds and the cost of funds paid by the borrower. The implicit subsidy is the difference between the cost of funds to the government and the market rate of interest. A simple example may clarify the pure loan component, the pure grant component and the implicit and explicit portions of the pure grant component. For simplicity, this example dispenses with the complications of maturities and discounting. In other words, assume for this example the terms of the government borrowing from the public, the firm's borrowing from the government, and the hypothetical firm's borrowing from the private sector loan are the same.

If the government pays 12 percent for its borrowing and then lends to a private firm at 7 percent, the total amount of the pure

loan effect is 7 percent, the cost of funds to the firm. If the best rate of interest the firm could obtain in the private capital markets is 15 percent, the total amount of the subsidy to the firm is 8 percent (15 percent - 7 percent) annually. This subsidy can be further divided into two parts. The explicit portion of the loan is 5 percent, which is equal to the government's cost of funds minus the share paid back by the firm (12 percent - 7 percent), and an implicit component of 3 percent, which measures the additional benefits received by the borrower compared with her opportunity cost of funds (15 percent - 12 percent). The explicit portion of the pure grant component represents the cost of the program to the government. The implicit portion of the pure grant component does not represent a direct cost to the government, but does represent additional efficiency losses to the economy, since capital is diverted from private capital markets and projects that would yield a return of 15 percent or more. It is worth noting that the explicit portion of the subsidy may be negative in cases where the government's cost of funds are lower than the rate charged to the private firm.

To calculate the costs of a subsidy program, the explicit subsidy can be calculated and the implicit subsidy overlooked.[3] The reason for neglecting the implicit subsidy is that the terms of a market loan are not observable for most subsidy recipients.

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[3] Industrial Revenue Bonds include only an implicit subsidy. Therefore the methodology outlined here cannot be used to evaluate their cost-effectiveness.

Most of these loan recipients are firms that could not borrow in private capital markets, so none of the existing measures of market interest rates are accurate reflections of their true cost of capital. Second, calculations of the explicit subsidy, which reveals the direct cost of the program to government, is sufficient for making comparisons of cost-effectiveness across capital subsidy programs, and between capital subsidy programs and other forms of economic development assistance. Furthering these comparisons is a major purpose of the paper.

In order to calculate the explicit subsidy in each loan the following steps are taken. (1) The annual payment (P) the firm must make to retire its subsidized loan is calculated. This annual stream of payments is determined by the loan amount (A), the subsidized interest rate (i), and the length of the loan (N). The equation for the case where there is no grace period is as follows:

(1) $$P = A\left[\frac{i}{1 - \left[\frac{1}{(1+i)^N}\right]}\right] \quad \text{where:} \quad \frac{i}{1 - \left[\frac{1}{(1+i)^N}\right]} = D_N$$

Analogously if the same loan were made at the government's cost of funds, i*, then the annual payment the government (P*) must make to retire a bond with an equivalent maturity (N) is equal to:

(2) $$P^* = A\left[\frac{i^*}{1 - \left[\frac{1}{(1+i^*)^N}\right]}\right] \quad \text{where:} \quad \frac{i^*}{1 - \left[\frac{1}{(1+i^*)^N}\right]} = D_N^*$$

The value for ($i^*$) should be selected to correspond to the maturities on the low-interest loans. For example, if the low-interest loans have a maturity of 10 years, then the $i^*$ for 10 year government bonds should be adopted.

The annual explicit value of the subsidy is calculated by subtracting item P from $P^*$, where:

$$(3) \qquad S = P^* - P = [D_N^* - D_N] * A$$

The subsidy (S) is a stream of subsidies occurring N years into the future. The next step (4) is to calculate the present value of this stream of subsidies, to obtain the present subsidy value of the loan (T). The total subsidy value is equivalent to:

$$(4) \qquad T = [1 - [D_N/D_N^*]] * A$$

(5) Any grants that accrued to the firm should also be added to item (4), for a total subsidy value (TS). Another way to think of TS is that the firm should be indifferent between either an up-front lump sum payment of TS or a loan of A, at interest i, of term N, when the opportunity cost of capital is $i^*$.

The appendices demonstrate how these calculations can be carried out in LOTUS 123 for two common subsidized loan packages. Appendix A demonstrates the simplest case where interest is subsidized, but there is no grace period prior to loan repayment. Appendix B demonstrates the case where the program includes loans

with a grace period of no payments and no accumulating interest during the grace period.

The total subsidy value for the case where the government pays a portion of a firm's interest on a private sector loan is similar to the case outlined above. Again, the annual subsidy is equal to the firm's annuity subtracted from the payment required to pay off the private sector loan. The present value of this stream of subsidies, plus any up-front or grants, is equal to the total subsidy value. This total subsidy value, item (5) above, is the numerator in a cost per job estimate.

Estimating Job Creation

Counting the number of jobs attributable to a loan subsidy program can also present surmountable difficulties. One issues is when to collect the employment totals. One approach is to count job creation immediately after the plant and equipment, purchased with the subsidized loan, is in place and the first round of hiring complete. A second approach is to wait a given period of time after the first round of hiring. Job creation estimates will vary depending how long after the plants opening, expansion, or retention the job figures are collected.

A second and more difficult problem in estimating job creation is determining whether firms would have made the same investment and generated the same jobs in an equally distressed location in the absence of the capital subsidy. According to a common criticism, credit subsidy programs do not influence investment and

location decisions because capital costs are too small a proportion of the average firm's costs. The value of capital subsidies are made even less influential by the tax deductibility of interest payments on firm's federal income taxes. Proponents of low-interest loan programs argue firms participate in low-interest loan programs only when they are excluded from private capital markets. If firms could borrow in private capital markets at reasonable interest rates they would rather not bother with the added red tape of a government loan. According to this line of reasoning, capital subsidies can affect business location and investment decisions. Since examples of both cases can be found, the truth probably varies by borrower and nature of the program (Wassail and Hellman 1985).

In order to calculate the number of jobs attributable to a capital subsidy program, it is necessary to subtract jobs that would have been created by recipient firms in the absence of the program. The best approach is indepth case studies of project financing. However, the cost and time involved in conducting such studies is often prohibitive. A second best strategy is through shorter interviews with individuals involved in the project application and site location or expansion decisions.

## Introduction to The Urban Development Action Grant Program

The purpose of the Urban Development Action Grant (UDAG) program is to stimulate employment in distressed urban and rural communities in the United States. In contrast to UDAG's

precursors, such as Model Cities, UDAG regulations require that each application for funds include a letter of commitment from the developer and at least $2.50 of private investment for every dollar of UDAG funds. The UDAG program supports industrial, commercial, and residential developments. Assistance takes the form of a grant from the federal government to the locality where the recipient firm is located. The assistance is, in most cases, a low interest loan from the locality to the firm. However, in some cases the locality grants the funds to the firm or uses the money to provide firm-specific infrastructure, such as a parking garage.

The rural component of the UDAG program was examined in-depth for this study. Approximately 10 percent of all UDAG funds have been allocated for projects in rural communities, where rural is defined as communities of 50,000 population or less that are not part of a Metropolitan Statistical Area. Our evaluation found that rural UDAG grants were successfully allocated to the most distressed rural communities and to rural communities of all sizes (Howland and Miller 1988a).

Under pressure to reduce the federal budget deficit, Congress acquiesced to Administration pressures to eliminate funds for the UDAG program in Fiscal Year 1989. Projects approved in FY 1988 will proceed, and some new projects will be funded from monies recaptured from previously approved projects that did not go forward.

The data used in this study are obtained from three sources, the U.S. Department of Housing and Urban Developments data base on

all UDAG projects; a telephone survey of 167 rural communities that received UDAG grants and, for 101 of those communities, telephone interviews with the plant manager or firm owner involved with the UDAG application process and firm location, expansion, or retention decision, and five in-depth on-site case studies.

For the rural UDAG program, HUD collected job totals at the time of program closeout, the stage at which the firm had finished their building, installed their capital equipment, and hired their original workforce. For a sample of 101 manufacturing projects initiated between 1978 to 1983, we also collected data on the number of employees as of the Fall of 1987. The survey was limited to projects funded between 1978 and 1983 so there was sufficient time after the plant's investment to assess the plant's accomplishments and stability. After subtracting the original numbers of employees in the cases of plant expansions, we found substantially larger employment totals in Fall 1987 than the totals reported by HUD at closeout. One reasons for the larger job totals in the later period may be that the companies' markets were more established and there was more time to train and hire new workers. A second explanation is that our sample of projects were completed and the initial job totals collected in the midst of the early 1980s recession. The Fall 1987 survey was taken during an economic expansion.

We approached the problem of assessing the extent to which private investments would have been made in the absence of UDAG assistance by asking plant owners in the case of small firms and

site-location decision makers in larger firms whether their firm would have made a similar investment in the same distressed community in the absence of the UDAG grant. We suspect the direction of the bias is for firms to claim capital assistance was a factor in their location or expansion decision, even when it was not. However, there are three reasons we believe our results provide reasonable estimates for estimating job creation as a consequence of the UDAG program. First, we made it clear to interviewees that we were independent researchers, not connected with the U.S. government. Second, these were projects that had received project approval from 6 to 9 years earlier and had already secured and spent the funds. It was clear to interviewees that there was no chance their loan would be jeopardized by admitting at this point they would have made the investment without UDAG funds.

Third, our results are consistent with those of other researchers. HUD hired independent accountants to evaluate the financing arrangements of UDAG deals to determine the extent to which public funds merely replaced private funds. Our telephone survey found admissions of displacement of private capital in 28 percent of the projects. The HUD researchers found evidence of displacement in 13 percent of the cases and inconclusive results in another 15 percent of the cases. Using a methodology similar to ours in evaluating other low-interest loan programs, Kwass and Seigel found evidence of displacement in 19 percent of EDA projects, and Sazama found 50 percent of the state loans in five

Northeastern states went to firms that did not need them.

Complexities in Measuring Job Creation: Two Case Studies

Two of our five case studies demonstrate the tentative nature of job estimates and the difficulty of assessing the role of a loan program in job creation. A bicycle pedal manufacturer in a distressed rural Illinois town received a UDAG grant in 1983 to purchase capital equipment for manufacturing plastic pedals. The plant is the sole U.S. branch of a foreign parent. The face value of the loan was $200,000, with an interest rate of 5 percent and a repayment period of 10 years. There was a three year grace period before the loan repayment had to begin.

Metal pedals was the companies sole product line until receipt of the UDAG grant. However, plastic pedal were in increasing demand from bicycle producers, not only because of the lower cost but because they are safer. Bike producers had already been sued as a result of ligament injuries caused by metal pedals. Company and town officials made a convincing argument that the investment in plastic pedal machinery would not have been made in the absence of the low interest loan. Prior to the installation of the plastic pedal equipment, the Illinois branch employed 23 production workers to operate the metal pedal machinery. With the addition of the plastic pedal capacity an additional 19 workers were hired.

While employment rose immediately after the purchase of the new equipment, it had fallen by Fall 1987 to pre-UDAG levels. Metal pedals became obsolete much faster than industry experts

predicted, and the metal pedal machinery was idled in mid- 1987, laying off 23 workers. Huffy, a major purchaser of metal pedals stopped purchasing metal pedals altogether in July of 1987. A cursory examination of employment statistics in the Fall of 1987 leads to the interpretation that the UDAG grant did not generate additional employment. In fact, there was a net loss of 4 jobs.

However, a further examination of plant conditions provides another interpretation. This company was among the first bike pedal manufacturers to come out with plastic pedals and as a consequence it survived when other domestic producers have either closed or phased out the pedal portion of their manufacturing operation. With its early investment in plastic pedal capabilities, the UDAG recipient was in the forefront of plastic pedal production, and is currently running its plastic pedal machinery on a 24 hour basis. In 1987, for the first time, the plant turned a profit and gave employees a raise.

The bike pedal manufacturer has also been helped by the recent declines in the value of the dollar. The foreign parent is considering shifting other product lines, such as Halogen lights, from foreign plants to rural Illinois. Thus, while net employment figures suggest a loss in employment, the argument can be made that the capital subsidy program is responsible for the existence of the plant, the current employment of 23 individuals, and the possibility of additional jobs in the future. This case highlights the shortcomings of simply counting jobs as the sole criteria of success.

A second case study also highlights the complexity of many capital subsidy projects and the difficulty of determining the number of jobs that would have been created without capital assistance. A craft yarn manufacturer in South Carolina admitted he would have made the same plant startup decision in the absence of UDAG assistance. However, in this case he would most likely have made the investment in another equally distressed community, one without the initiative to seek a federal UDAG grant.

The craft yarn company used the UDAG assistance to purchase the most up-to-date yarn carding and spinning equipment. Without the UDAG grant, the firm intended to purchase used, but more labor-intensive capital equipment. Again, a cursory review of the case suggests, no new net employment was created, but just reallocated across towns. In fact, an argument could be made that the capital subsidy resulted in a loss in employment, since the grant allowed the purchase of more modern capital-intensive carding and spinning equipment.

However, the appropriate interpretation is more complex. In 1980, the market for craft yarn was absorbing 110 million lbs per year, and there were nine domestic companies producing craft yarn. By 1987, the market had declined to 40 million lbs, and five of the domestic craft yarn companies had gone out of business. In addition, the strong dollar resulted in more intense competition from foreign producers of craft yarns. The owner of the UDAG recipient firm believes that without the most modern equipment, his plant would not have been one of the lowest cost producers and

would not have survived the early 1980s. Ultimately all jobs would have been lost to the regional economy.

The results of these case studies indicate that job creation numbers are estimates only and that loan programs can change the scope or nature of a project in subtle ways. Clearly, identifying the number of jobs directly attributable to a capital subsidy program is difficult. These case study results also provide some anecdotal evidence to counter the commonly recited charges that capital subsidy programs merely result in the displacement of labor by encouraging capital intensive production, or that capital subsidies are too small to influence a firm's location and investment behavior.

Estimating Job Creation in the Rural UDAG Program

Recognizing the complexity of identifying jobs attributable to a capital subsidy program, our approach to estimating the number of jobs attributable to UDAG is two-fold. First, we selected a sample of 169 cities that received UDAG grants for manufacturing projects between 1978 and 1983. This is includes one-half of all rural communities that received assistance for manufacturers in those years. We limited our study to manufacturers, although commercial and residential developers were also eligible for UDAG assistance. One reasons is that manufacturers received the largest

share of UDAG assistance in rural areas.[4] Nearly 50 percent of all rural UDAG funds went to manufacturers. A second, and more important reason, is that in the case of manufacturers it is possible to identify individuals who are familiar with site location or expansion decisions and current employment totals. In the case of commercial and residential developments, the developer is frequently no longer the owner, and if still a commercial owner, has little idea about the employment in the various service firms that occupy their building.

We first interviewed the city officials responsible for orchestrating the UDAG grant in each town in the Fall of 1987 by telephone to determine whether the plant still operated and how many workers were currently employed. Out of the 169 interviews with city officials, we found 139 plants were still operating, 17 recipients had closed but the facility was now occupied by a new employer, and 14 facilities had closed and were standing vacant. Of the 138 UDAG recipients still in business, we were able to obtain interviews with 101. Job totals provided by the city were cross checked with the job totals provided by the business. Out of the 101 business interviews, there were 89 cases, where we could locate the individuals involved with expansion or location decision and the UDAG application process. Most missing observations were in branch plants where the individuals involved with the UDAG

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[4] For a further elaboration on the characteristics of the rural UDAG program, see Marie Howland and Ted Miller (1988b).

application process had retired or changed employers.

In the 89 cases, the individual affiliated with the site location decision or expansion decision was identified and contacted. The key individual was then asked about the role of UDAG funds in the site location or investment decision. Of the 89 responses, 28 percent stated they would have made the same investment in their current location without UDAG funding. In these instances the number of jobs created was set to zero, although the costs of the government subsidy are included.

As the above caveats and case studies indicate, the job creation estimates based on this question provide only rough estimates of the number of jobs created as a result of the UDAG program. Overestimates may occur because interviewees were reluctant to say UDAG was not key to their investment. Underestimates may occur when the UDAG grant was responsible for improving the competitiveness and survival of recipients, but did not create new jobs as originally intended. Jobs created in secondary industries are ignored here because our research indicates that rural manufacturers have weak linkages to local firms, services, and markets (Howland and Miller 1988a). Thus few jobs, outside the businesses, could be attributable to the UDAG grant. Evaluations that find stronger interindustry linkages may want to include secondary job creation. Finally, there were 14 plants that registered workers at project closeout, but had failed and their facilities vacant by the Fall of 1987. These businesses provided at least some short term employment for their communities,

which is not included in the Fall 1987 count. Another 17 UDAG recipients failed, but their facilities were occupied by new tenants. Since it is unclear to the extent to which the UDAG-subsidized infrastructure attracted the new tenant, the costs and jobs in these facilities were excluded. Although an important factor in program success, we do not attempt to deal here with the issue of job quality.[5]

[5] Issues of job quality, including wages paid and nature of the job, are addressed in Howland and Miller (1988b)

Final Cost Estimates

Table 1 reports the final cost per job estimates. The figures in Column I report the job totals under different assumptions. The figures in Column II report the cost per job when the job totals are those shown in Column I. The federal cost of funds used here ($i^*$) is 11.19 percent. This is the average cost interest paid on federal bonds between the years 1978 and 1983.[6] The discount rate used in calculating the present value of the stream of subsidies is also the federal funds rate of 11.19 percent.

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[6] U.S. Bureau of the Census, Statistical Abstract, Washington, D.C.: Government Printing Office, 1987, Table 833, P. 493.

Unfortunately, the HUD UDAG data base does not record information on the length of any grace period. Rather the HUD staff have calculated an average interest rate paid over the length of the loan, which incorporates the grace period. Because this average interest rate gives a subsidy in an earlier year the same weight as a subsidy in a later year, and greater subsidies generally occur at the beginning of the loan, the total subsidy values calculated here may underestimate the true value of the subsidy by some small amount.

Table 1

Final Results - Jobs Created and Cost Per Job

| | Jobs Created | Cost per Job/e |
|---|---|---|
| Jobs at Closeout/a | 9,066 | $4,216 |
| Promised Jobs/b | 13,340 | $2,865 |
| Jobs in Fall, 1987/c | 19,466 | $1,963 |
| Net Jobs Created by UDAG/d | 12,754 | $2,997 |

N. of observations = 104. Includes 89 interviews + 14 firm failures. The 17 cases where the original firm had closed by new firms occupied the facility were eliminated.

a At point where first round of hiring is complete. Source: HUD UDAG grant agreement data base.

b The number of jobs promised as part of the grant agreement between the firm and HUD. Source: HUD UDAG grant agreement data base.

c Jobs as measured in the Fall of 1987. Source: Urban Institute Survey

d Total jobs in Fall 1987, jobs are set to zero when manager/owner admitted a similar investment would have been made in the absence of UDAG. Urban Institute Survey.

e Based on the annual average government cost of funds during 1978 and 1983 of 11.19 percent.

## What Does This Mean For Planners?

This research contains lessons for planners considering the startup or the evaluation of existing interest subsidy development programs. The cost of creating rural manufacturing jobs through the UDAG program are low, with estimates ranging from a cost of

$1,963 to $4,216 per job created. These findings indicate low-interest loan programs can be a cost-effective tool for economic development in distressed rural communities if the program is designed to carefully screen firms who would make the investment without the assistance.

Moreover, the evidence indicates low interest loan programs are a relatively inexpensive means of job creation in distressed areas when compared to other economic development programs such as outright grants. For example, the cost per job in the Title I - Public Works Program was estimated to be approximately $19,000 by Centaur and Associates (1980). The Title I program provides grants to local governments and non-profit organizations for public works projects in distressed regions of the county. The cost per job in the now-defunct Local Public Works Program, which also provided grants for public works, was estimated to be between $13,000 and $15,000 (Economic Development Administration 1980).

There are three additional lessons for planners evaluating existing interest subsidy programs. First, this study describes a methodology for measuring program costs. This method, which can easily be replicated using LOTUS 123, is an improvement over that used by earlier studies in that it captures the full government cost inherent in each subsidized deal, circumvents the problem of unobservable private market loan terms for program participants, provides a clear justification for a single discount rate, and permits cross-program comparisons of cost effectiveness.

A second lesson is that job creation estimates will vary

with the timing of data collection. Our job estimates collected by telephone surveys with both city officials and plant managers in 1987 were more than twice as high as the estimates provided by HUD and collected when the projects were completed between 1978 and 1983.

A third lesson is there are limitations to measuring program effectiveness solely in terms of job creation. Aside from the common criticism that job counts do not assess the quality of the jobs, the case studies provide evidence that capital subsidies can improve firm competitiveness and contribute to local economic stability without adding additional jobs.

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