

Selective Employment Subsidies: Can Okun's Law Be Repealed?

By JOHN BISHOP and ROBERT HAVEMAN

Concern that structural factors impede efficient labor market performance is evidenced in both statistical analyses of economic potential and policy proposals for selective employment subsidies. Estimates of the level and expected growth of full-employment *GNP* have recently been revised downward, as has the 3.2 unemployment multiplier implicit in Okun's Law (see U.S. Council of Economic Advisers and George Perry). These indications of structural changes in labor markets reinforce statistics showing excessively high unemployment rates for youths and blacks, and labor force participation rates that are increasing for women and decreasing for men.

The simultaneous concern with high inflation and high measured unemployment, in the context of major changes in labor force composition and increased variance in sectoral unemployment rates (see Perry), has brought forth numerous and sizable selective employment subsidy policies (*SESP*) in both the United States and Western Europe. The *SESP*, changes in potential *GNP*, and Okun's Law are not unrelated phenomena. This paper explores that relationship. Section I presents a brief taxonomy of the primary *SESPs* which are currently being discussed in Western industrialized countries. Section II provides the economic rationale underlying these measures. Section III explores the relationship of *SESP* to the prospective growth of aggregate output, in the context of Okun's Law. Evidence on the existence and magnitude of changes in employment decisions in response to the New Jobs Tax Credit (NJTC) is presented in Section IV.

I

Wage (or employment) subsidies have been the primary measure designed to target employment demands on those sectors with substantial excess supply. They have appeared in various guises. A *SESP* can be a function of recruitment (additional hires), the existing employment stock, or changes in the employment stock. Each of these subsidies can be targeted on particular types of labor (say, by age, sex, region, unemployment duration, or education), or they can be general in nature. Moreover, the subsidy can be a flat amount or it can vary with the level of earnings, the wage rate, or the duration of coverage. It can be paid to the employer or to the worker, either directly or via a tax credit.

Examples of several of these variants have been recently implemented (see Haveman and G. B. Christainsen). The United States' NJTC is a constrained marginal stock subsidy with no targeting. In calendar years 1977 and 1978 firms expanding employment above 102 percent of the previous year's employment level receive a tax credit equal to 50 percent of the first \$4,200 of wages paid each additional employee up to a maximum of 47 employees or \$100,000 of credit. On the other hand, the 1975 British Temporary Employment Subsidy is a reverse recruitment rather than a stock subsidy, and like the NJTC it is temporary and nontargeted. This program subsidizes about 30 percent

of the wage costs for up to one year of workers who would otherwise be laid off. In 1974, the West German government introduced a temporary targeted recruitment subsidy with a marginal stock constraint. For six months, a wage subsidy of 60 percent was paid to firms in specified regions for employing registered unemployed workers, if the firm's employment increased from that of a stipulated date prior to passage of the act.

The Netherlands, France, and Sweden have also recently adopted targeted employment subsidies. The percentage of the labor force on which *SESP*-type subsidies are paid varies from about .3 percent of the labor force in West Germany to 3-4 percent in Sweden. In 1978, the NJTC will be paid on the employment of nearly 1 percent of the U.S. labor force at a total budget cost of at least \$2 billion.

While few reliable evaluations have been made of these *SESP*s, the numerous extensions of what were to be temporary programs suggest that they have not been viewed as failures in achieving the primary objective—employment increases set for them. In the United States, the Carter Administration has proposed replacing the lapsing NJTC with a Targeted Employment Tax Credit that would subsidize firms for 33 percent of the first \$6,000 of first-year wages paid to low-income workers who are either 18-24 years of age or handicapped, and for 25 percent in the second year. As revised in Congress, the proposal will likely become a hiring subsidy rather than a stock subsidy, and the target group will be expanded to include welfare recipients.

II

The economic rationale for *SESP* is straightforward: By reducing the price of labor at the margin, employment will be encouraged, unemployment reduced, price pressure will be reduced in competitive markets through a reduction in the marginal cost function for incremental output and, in the case of marginal stock subsidies, entry will be encouraged. Further, for firms engaged in external trade, *SESP* operates as an export subsidy (see Layard and Nickell). Indeed, for a number of Western European nations, this characteristic is viewed as a primary rationale for *SESP*. A temporary *SESP* encourages firms to incur labor costs earlier than otherwise. As a result, inventory accumulation or accelerated maintenance and investment spending will tend to increase. Finally, *SESP* (particularly nontemporary programs) will tend to induce the substitution of targeted labor for nontargeted labor. For example, it may induce adding a second shift rather than increasing overtime (see Jonathan Kesselman, Samuel Williamson, and Ernst Berndt).

Inevitably, however, the net job creation impact of a *SESP* - defined as the employment level in the economy with the policy less that without it will, because of financial, output, and labor market displacements, be smaller than the gross number of jobs subsidized. A fully specified general equilibrium model is necessary to accurately estimate the net effects of a *SESP*.

If *SESP* is targeted on a resource in excess supply or with a positive and nontrivial supply elasticity (such as handicapped workers, transfer program recipients, and low-income youth (see Stanley Masters and Irwin Garfinkel)), potential *GNP* defined as the level of *GNP* when *NAIRU* (the rate of unemployment that does not accelerate inflation) is attained will rise. Even if the labor markets for these workers were free from distortions associated with minimum wage and tax and transfer programs, a wage subsidy of their employment paid for by a tax on other workers would raise potential *GNP* (see

Bishop, 1977). Indeed, *SESP* can also increase potential *GNP* even if the labor force participation rate of each demographic group is fixed by reducing a wage-weighted *NAIRU* through concentrating employment increases on sectors with elastic sectoral Phillips curves (see Martin Baily and James Tobin).

The benefits of expanding potential *GNP* in this manner are increased by the fact that the labor supply decisions of targeted groups are distorted by high employer- and employee-paid taxes, and even higher marginal reduction rates of transfer benefits. Consequently, any resulting increase in actual and potential *GNP* through such employment increases will be positively correlated with the change in economic welfare. Moreover, pecuniary externalities for taxpayers are created by the increase in tax revenues and the decrease in transfer costs associated with *SESP*, both of which reduce the net budgetary cost of the program.

Further a subsidy of one of the major costs of doing business will exercise downward pressure on prices during the transition to a new price level. This temporary reduction in inflationary pressure may feed back into inflationary expectations, and have a longer-run impact on price inflation.

In addition to its effects on actual and potential *GNP* and prices, *SESP* will tend to shift the composition of employment and earnings toward low-skill, target-group workers. If less inequality in the distribution of the adverse effects of poor economic performance is desired, this is a major benefit of *SESP*. One consequence of this redistribution is that, even with a constant *GNP*, the number of employed persons will increase as low-productivity workers are substituted for those with higher skills.

III

Because of these likely effects of *SESP*, the macroeconomic relationships between changes in *GNP*, the *GNP* gap, and the unemployment rate will be altered. In standard policy models, increases in aggregate demand are viewed as closing the gap by increasing actual *GNP* toward some exogenously determined full-employment *GNP*. However, as indicated above, *SESP* is likely to increase simultaneously both the actual and a *NAIRU*-based potential *GNP*. Hence, a *SESP*-induced increase in *GNP* will reduce the conventionally measured *GNP* gap by more than it reduces the true gap. The *SESP* will also alter the relationship between the measured *GNP* gap and the unemployment rate. A *SESP*-induced increase in *GNP* will tend to be associated with a larger increase (decrease) in employment (unemployment) than is typically associated with general aggregate demand-induced changes in *GNP*.

Consider the following accounting relationship between *GNP*, productivity (*A*), employed capital (*K*), hours worked per week (*H*), and labor force participation rate (*L*):

$$(1) \ dGNP = dA + (I - B_L) dK + B_L(dH + S_n dL - S_n dU)$$

where dx indicates the percentage rate of change of x , $U = -100 \log(\text{employment/labor force}) \approx$ the unemployment rate, B_L is the share of labor, and S_n is the ratio of the skill level of newly employed workers to the economy-wide average. Okun's Law is a reduced form of (1) which states that a 1 percentage point cyclical change in U is associated with a 3.2 percent change in *GNP*. While a percentage point decrease in U is directly associated

in (1) with an increase in GNP equal to $B_L S_n$ (approximately .7 of a percentage point), cyclical changes in other determinants of GNP namely, L , H , K , and A are negatively associated with U . It is the sum of these effects that makes up the difference between .7 and 3.2.

There are at least three reasons why a 1 percentage point change in U induced by a $SESP$ is not likely to increase GNP by 3.2 percentage points. First, a $SESP$ -induced reduction in U will shift the composition of employment toward workers with $S_n < 1$ and increase the training costs of the firm. The inevitable result of such substitution is to reduce measured productivity, at least in the short run, and S_n and $|dA/dU|$ will fall as these costs are recorded in firm accounts.

Second, $SESP$ encourages the hiring of part-time workers (especially if the per worker subsidized earnings level is capped) or the substitution of additional workers for increased overtime of existing workers. As a result, the response of H to changes in U will be smaller than otherwise - $|dH/dU|$ will fall.

Third, to the extent that target group labor is not complementary with capital services, as is likely, the utilization of capital will not increase as much as in the case of an equivalent general demand stimulus - $|dH/dU|$ will fall.

Finally, because of the limited knowledge on behavioral responses, the effect of $SESP$ on $|dH/dU|$ is unknown. On the one hand, target group workers form a high proportion of the discouraged worker, nonlabor force participant category. On the other hand, $SESP$ may not generate as large an increase in labor force participation as an equivalent reduction in U stimulated by a general expansion in demand.

Thus, at least during the period of adjustment following enactment of a nontrivial $SESP$, Okun's Law is likely to be repealed. The reduction in the Okun unemployment multiplier associated with $SESP$ is evidence that the policy is having the effects for which it is designed-increasing potential GNP and redistributing the costs of unemployment.

However, these effects do not come at zero cost. The $SESP$ is not easy to administer. A marginal stock variety of $SESP$ tends to favor new and fast-growing firms and regions. In addition, $SESP$ may increase labor turnover, especially if it is temporary or of the recruitment variety. Finally, $SESP$ with narrowly defined target groups (for example, low-income youth or welfare recipients) may result in the displacement of equally disadvantaged workers who may have more central positions in family units.

IV

None of these impacts of $SESP$ will materialize if firms fail to change their behavior in response to the subsidy. In some past programs (for example, WIN and $JOBS$), that response was not substantial (see Daniel Hamermesh). Administrative costs or the low-productivity signaling effect of the subsidy apparently weakened the employment incentive for which the programs were designed.

The $NJTC$ has been in operation for more than a year. While a definitive assessment of its effect on employment and prices is not yet possible, a preliminary evaluation can be made. In theory, the $NJTC$ should provide a major stimulus to employment, as firms which typically hire part-time or part-year workers will find that the labor costs of an expansion are cut nearly in half. The \$100,000 per firm limit on the

subsidy suggests that small and medium sized firms will experience the largest employment incentive.

Nonseasonally adjusted monthly data on employment and man-hours in construction and retailing were regressed on seasonal dummies, trends on the seasonal dummies, and three-year distributed lags of input prices (gross employer wages, W ; wholesale price of construction materials, M , or consumer finished goods, P ; materials, services, and energy prices, Q ; gasoline and electricity prices, G ; and a rental price of capital, R). The lag structures were freely estimated, with each input price or price ratio being represented by its contemporaneous value, and that of each of the previous four quarters and four half-years. Exogeneity tests which entered future values of the wage rate into the equation tended to confirm the hypothesis that wage and man-hours are simultaneously determined. Consequently, all models were estimated using two-stage least squares.

The *NJTC* variable is an average over the past six months of the proportion of firms (weighted by employees) that had knowledge of the credit. It has a value of .057 in June 1977 and rises at an average rate of .0424 per month, reaching .343 in January 1978 and .572 in June 1978.

All of the *NJTC* coefficients are positive and significant in Models I and II, where input prices enter as ratios (see Table 1). When input prices enter nominally (Models III and IV), the coefficients are smaller and insignificant. Across all of the regressions the (point) average *NJTC* employment stimulus over the mid-1977 to mid-1978 period ranges from 150,000-670,000. For these industries, actual total employment growth over the period was 1.3 million. The Model III and IV estimates attribute at least 20-30 percent of the observed employment increase in these industries to *NJTC*. These results are consistent with the observation that between 1977II and 1978II rates of employment growth have substantially exceeded rates of output growth in both construction and retailing. In construction, employment grew at an 8.2-9.9 percent rate-double the 4.5 percent growth rate of real construction output. Even in retailing, where cyclical changes in employment are small, the 3.0 percent growth of real sales lagged behind the 3.4-4.0 percent growth of employment. The contrast between construction man-hours and employment regressions also suggests that the *NJTC* has, as predicted, caused a reduction in average hours per week (see Bishop, 1978).

To test the relationship between prices and subsidy-induced marginal cost reductions, the monthly change in retail price was regressed on current and lagged changes in a number of industry cost variables (wages, wholesale product prices, materials, services, and energy prices, a rental price of capital, and excise taxes), the unemployment rate, and the level and trends in seasonal dummies. For nonfood commodities and restaurant meals the retail trade margin is negatively and significantly related to the *NJTC* variable (see Table 2). Between May 1977 and June 1978, retail nonfood commodity prices rose 4.73 percent, while the counterpart wholesale prices rose 6.56 percent. This discrepancy of 1.83 percentage points approximates the preferred *NJTC* estimated effect of 2.2 percent ($.038 - .572 * 100$) (col. 1). The observed decline in the margin is particularly surprising given recent increases in the relative price of imported consumer goods. (Imported products, it should be noted, are included in retail but not wholesale price indexes.)

TABLE 1—IMPACT OF THE *NJTC* ON EMPLOYMENT
IN CONSTRUCTION AND DISTRIBUTION

Sample—1952–78:06	Coefficient on <i>NJTC</i> under Alternative Specifications ^a			
	I	II	III	IV
Employment				
Wholesale and Retail	.076 ^b	.101 ^c	.064	.061
Household Data	(.048)	(.050)	(.059)	(.044)
	<i>.0121</i>	<i>.0119</i>	<i>.0121</i>	<i>.0122</i>
Retail	.045 ^c	.047 ^c	.030	.031
Establishment Data	(.019)	(.020)	(.023)	(.020)
	<i>.0044</i>	<i>.0045</i>	<i>.0044</i>	<i>.0050</i>
Construction	.196 ^c	.166	.166	.052
Household Data	(.079)		(.108)	(.102)
	<i>.0336</i>		<i>.0297</i>	<i>.0353</i>
Construction	.180 ^c		.020	.052
Establishment Data	(.053)		(.108)	(.102)
	<i>.0175</i>		<i>.0155</i>	<i>.0173</i>
Man-Hours				
Construction	.110		.025	.007
Establishment Data	(.078)		(.108)	(.091)
	<i>.0340</i>		<i>.0302</i>	<i>.032</i>
Average <i>NJTC</i> -Induced Employment Δ in 12-month period preceeding June 1978 (in thousands)				
Household Data	669	575	565	410
Establishment Data	412	203	154	255

Source: See Bishop (1978).

^aEstimated with two-stage least squares. The standard error of the coefficient is shown in parentheses, and the standard error of the estimate in italics beneath the coefficient. Model I: $E = \beta_0 \cdot NJTC + \beta_1 X + \beta_2 (W/P) + \beta_3 (R/P) + \beta_4 (Q/P)$ for retailing and $E = \beta_0 \cdot NJTC + \beta_1 X + \beta_2 (W/M) + \beta_3 (R/M)$ for construction where X is the vector of output lags, seasonal dummies and trends. Model II: Adds $\beta_5 (G/P)$ to Model I. Model III: Enters W , R , Q , M , and P nominally, rather than as ratios. Model IV: Same as III, but with distributed lags limited to 1.5 rather than three years.

^bSignificant at .05 level on a one-tail test.

^cSignificant at .025 level on a one-tail test.

TABLE 2—IMPACT OF THE *NJTC* ON THE MARGIN
BETWEEN RETAIL AND WHOLESALE PRICES

<i>CPI</i> Component	Coefficient on <i>NJTC</i> under Alternative Specifications ^a			
	One-Year Distributed Lag			Six-Month Lag
	Trends on Seasonals		No Trends	Trends
	with <i>Q</i>	without <i>Q</i>	with <i>Q</i>	with <i>Q</i>
Food Away from Home	-.036 ^c (.013) <i>.0017</i>	-.037 ^c (.012) <i>.0017</i>	-.032 ^c (.013) <i>.0017</i>	-.033 ^c (.013) <i>.0018</i>
Nonfood Commodities	-.038 ^c (.015) <i>.0020</i>	-.038 ^c (.015) <i>.0021</i>	-.031 ^b (.016) <i>.0022</i>	-.038 ^c (.015) <i>.0020</i>
Food at Home	.051 (.039) <i>.0053</i>	.041 (.038) <i>.0053</i>	.051 (.040) <i>.0052</i>	.051 (.038) <i>.0052</i>
All Commodities	-.018 (.016) <i>.0022</i>	-.019 (.016) <i>.0022</i>	-.013 (.017) <i>.0023</i>	-.018 (.016) <i>.0022</i>
Reduction in Consumer Costs between June 1977 and June 1978 (in billions)				
All Commodity Regression	3.4	3.6	2.4	3.4
Disaggregated Regressions	2.8	3.3	1.9	2.8

Source: See Bishop (1978).

^aThe standard error of the coefficient is shown in parentheses and the regression is shown in italics beneath the coefficient. Models estimated on monthly data 1953:03 to 1978:06. Weights for *Q* are based on the 1967 input-output table, which includes gasoline, electricity, telephones, containers, cellophane packaging, supplies, insurance, auto repair, and legal fees.

^bSignificant at .05 level on a one-tail test.

^cSignificant at .025 level on a one-tail test.

Among the subsectors, the pattern of coefficients is consistent with expectations. The large negative coefficients for the low-skill-intensive restaurant industry suggest that the 8-12 percent induced reduction in marginal costs caused a 1.1 percent decline in output price. On the other hand, the small margin, nonwage-intensive retail food industry has a nonsignificant positive coefficient, reflecting the greater contribution of incremental employment in this sector to quality than to the volume of output.

The final rows of the table indicate that the reduction of consumer costs attributable to the *NJTC* ranges from \$1.9-3.6 billion. By comparison, it is predicted that over its two-year life, *NJTC* credit claims will be \$3-6 billion.

These estimates of the impact of *NJTC* are for those sectors with the largest expected response. While across-industry displacements might offset these impacts, there is no clear reason why this would occur. While limited awareness of *NJTC* may have reduced its measured effectiveness, its temporary character may have led to inventory accumulation which a more permanent program would not induce.

No impact estimates based on only the first year of program experience can be conclusive. Perhaps the *NJTC* variable is capturing other exogenous forces inducing contemporaneous employment increases and price decreases, in which case improved specifications may reduce the estimated *NJTC* impacts. While a number of possibilities have been tried (for example, varying lags, trend shifts in 1974, and the addition of an energy price variable) without significant effects on the *NJTC* variable, other factors may be at work. Hence, the finding that *NJTC* has had sizable employment and price effects must remain tentative. It should be noted, however, that the procedure employed is more robust with respect to assumptions on the impact of taxation changes than those used to estimate the response of investment spending to taxation changes.

V

In sum, the case for *SESP* is a strong one. The level of employment is likely to be increased, its composition improved, *NAIRU* reduced, and the associated price increase lower with *SESP* than with an equivalent general stimulus to aggregate demand. And the (at least temporary) reduction in the Okun multiplier is evidence that *SESP* is inducing the behavior for which it was designed. The results from the *NJTC* regressions suggest that such employer hiring and price responses do occur. However, these responses are for a nontargeted program; extrapolation of them to a targeted *SESP* would be inconsistent with evaluations of previous such programs.

REFERENCES

M. Baily and J. Tobin, "Inflation-Unemployment Consequences of Job Creation Policies," in John Palmer, ed., *Creating Jobs: Public Employment Programs and Wage Subsidies*, Washington 1978.

J. Bishop, "The General Equilibrium Impact of Alternative Anti-Poverty Strategies: Income Maintenance, Training, and Job Creation," *Ind. Labor Relat. Rev.*, forthcoming.

J. Bishop, "Pricing and Employment in Construction and Distribution: The Impacts of Tax Policy," paper presented at Universities-Nat. Bur. Econ. Res., Conference on Low Income Labor Markets, June 9-10, 1978.

D. Hamermesh, "Subsidies for Jobs in the Private Sector," in John Palmer, ed., *Creating Jobs: Public Employment Programs and Wage Subsidies*, Washington 1978.

R. H. Havemana and G. B. Christainsen, "Public Employment and Wage Subsidies in Western Europe and the U.S.: What We're Doing and What We Know," National Commission on Manpower Policy, forthcoming.

J. Kesselman, S. Williamson, and E. Berndt, "Tax Credits for Employment Rather Than Investment," *Amer. Econ. Rev.*, June 1977, 67, 339-49.

Stanley Masters and Irwin Garfinkel, *Estimating the Labor Supply Effects of Income Maintenance Alternatives*, New York 1978.

G. L. Perry, "Potential Output and Productivity," *Brookings Papers*, Washington 1977, 1, 11-47.

U.S. Council of Economic Advisers, *Economic Report of the President*, Washington, Jan. 1977, 52-56.