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Comment on Feldstein and Poterba's "Unemployment Insurance and Reservation Wages"

by

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COMMENT ON FELDSTEIN AND POTERBA'S "UNEMPLOYMENT INSURANCE AND RESERVATION WAGES".

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Abstract. In a recent paper in this journal Feldstein and Poterba (1984) found that job seekers' reservation wages are strongly affected by the level of unemployment compensation. Based on this "partial-partial" analysis they draw the conclusion that reducing unemployment benefits could significantly lower the average duration of unemployment. In this comment I develop a simple theoretical model that casts considerable doubt on the reliability of "partial-partial" analysis in the search theoretic context and hence on the type of policy conclusions drawn by Feldstein and Poterba.

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1. INTRODUCTION

In a recent paper in this journal Feldstein and Poterba (1984) found that job seekers' reservation wages are strongly affected by the level of available unemployment compensation. Based on this finding, they draw a strong policy conclusion: "The estimates we have presented imply that reducing unemployment benefits could significantly lower the average duration of unemployment.." (p. 165).

This policy conclusion is based on a "partial-partial" analysis (to use Rothschild's (1973) expression); in particular, it is tacitally assumed that the distribution of firms' wage offers will not respond to changes in job seekers' search behavior. This type of analysis is not unique to Feldstein and Poterba's paper and in fact seems to be ubiquitous in empirical studies of the connection between unemployment compensation and unemployment duration. The general idea seems to be that "partial-partial" analysis gives reliable results in this area and that equilibrium analysis, in which behavior on both sides of the market is considered simultaneously, is mostly of aesthetic value.

In this comment I develop a simple theoretical model that casts considerable doubt on the reliability of "partial-partial" analysis in the search theoretic context and hence on the type of policy conclusions drawn by Feldstein and Poterba. In fact, under quite reasonable assumptions, the analysis indicates that the effects of unemployment compensation on unemployment duration suggested by Feldstein and Poterba are greatly overstated.

2. THE MODEL

Let $G(w,b)$ be the cumulative distribution of reservation wages, w, among the unemployed; b is an unemployment compensation parameter. The corresponding density function is $g(w,b) = G_w(w,b)$. Similarly, $F(w,b)$ and $f(w,b)$ are the distribution function and density function, respectively, of wage offers among firms. The initial value of the unemployment compensation parameter is b_o, and when $b=b_o$, we supress b in the notation, e.g., $f(w) = f(w,b_o)$.

Consider an individual whose reservation wage is w when $b=b_o$, and let $w^*(w,b)$ denote the reservation wage of such an individual when the unemployment compensation parameter equals b. Similarly, $w^{**}(w,b)$ is the wage offer of a firm whose initial wage offer (i.e., when $b=b_o$) is w, when the unemployment compensation parameter equals b. In particular, $w^*(w,b_o) = w$ and $w^{**}(w,b_o) = w$. Of course, w^* and w^{**} also depend on F and G, but these are already parametrized by b, the only exogenous variable in the model not being held constant.

Let $cG(w,b)$ be the labor supply faced by a firm offering a wage of w when the unemployment compensation parameter equals b; that is, the firm's labor supply is assumed to be proportional to the fraction of individuals with a reservation wage of w or less. The parameter c depends on "search intensity" and the like, and is held constant. Total employment is then given by

$$L = c \int_{-\infty}^{\infty} G(w,b)\, f(w,b)\, dw \qquad (1)$$

and it is shown in the appendix that

$$\frac{dL}{db} = \int_{-\infty}^{\infty} \left[w^{**}_b - w^{*}_b\right] g(w)\, f(w)\, dw \text{ , when } b=b_o \qquad (2)$$

This formula holds when both sides of the labor market are considered simultaneously. In the corresponding "partial-partial" formula w^{**}_b is simply set equal to zero, which is

permissible, of course, only if w_b^{**} is negligable compared to w_b^{*}.

Let firms be price takers on the goods market (which, by the standard textbook story, implies that there is no constraint on the demand side at the common price p) but wage setters on the labor market. (Of course firms must be wage setters; otherwise wage dispersion could not be sustained.) Assume constant returns to scale in production with output proportional to labor input. The proportionality factor, λ, can vary across firms.

A firm's maximation problem is then

$$\max_{w} (\lambda p - w)cG(w,b)$$

The first and second order conditions are

$$-G(w,b) + (\lambda p - w)g(w,b) = 0 \tag{3}$$

$$-2g(w,b) + (\lambda p - w)g_w(w,b) \leq 0 \tag{4}$$

When $b=b_o$, equation (3) gives the initial value, w, of the firm's wage offer. When b is allowed to vary, then equation (3) gives $w^{**} = w^{**}(w,b)$. Inserting $w^{**}(w,b)$ into (3) and differentiating with respect to b gives

$$-2g(w^{**},b)w_b^{**} - G_b(w^{**},b) + \\ + (\lambda p - w^{**})\left[g_w(w^{**},b)w_b^{**} + g_b(w^{**},b)\right] = 0 \tag{5}$$

In the appendix it is shown that at $b=b_o$

$$G_b(w,b) = - g(w,b)w_b^{*}(w,b) \tag{6}$$

Differentiating this expression with respect to w gives

$$g_b(w,b) = -g_w(w,b)w_b^{*}(w,b) - g(w,b)w_{wb}^{*}(w,b) \ , \ b=b_o \tag{7}$$

Using (6) and (7), equation (5) gives

$$\left[2g(w) - (\lambda p - w)g_w(w)\right]|w_b^{**} =$$
$$= \left[g(w) + (\lambda p - w)g_w(w)\right]w_b^{*} - (\lambda p - w)g(w)w_{wb}^{*} \qquad (8)$$

If all the unemployed get the same dollar change in unemployment compensation, then it seems reasonable to assume that individuals with high reservation wages will not alter theirs more than those with low reservation wages; i.e., w_b^* should be non-increasing in w. In this case $w_{wb}^* \leq 0$[1]. Non-negative profits require $\lambda p - w \geq 0$; thus, from equation (8)

$$\left[2g(w) - (\lambda p - w)g_w(w)\right]w_b^{**} \geq \left[g(w) - (\lambda p - w)g_w(w)\right]w_b^{*} \qquad (9)$$

By the second order condition (equation (4)),
$2g(w) - (\lambda p - w)g_w(w) \geq 0$; thus

$$w_b^{**} \geq \left[1 - \frac{g(w)}{2g(w) - (\lambda p - w)g_w(w)}\right]w_b^{*} \qquad (10)$$

In particular, for firms operating in the range over which the density of reservation wages is decreasing, i.e., $g_w(w) \leq 0$, it follows that

$$w_b^{**} \geq \frac{1}{2}\, w_b^{*} \qquad (11)$$

Thus, given the above assumptions, one can hardly say that w_b^{**} is negligable compared to w_b^*. Also, by referring back to equation (2), one can see that Feldstein and Poterba's policy conclusions are overstated.

3. CONCLUDING REMARK

This comment is based on the simple but fundamental idea that a policy-induced change in the distribution of individual's reservation wages will cause a change in the distribution of firms' wage offers. "Partial-partial" analysis ignores this change in the wage offer distribution. The analysis in the preceding section suggests that this equilibrium effect could be quantitatively important. Of course, suggestion is not proof, but one would expect the burden of proof to lie on those who rely on "partial-partial" analysis to draw strongly stated policy conclusions.

FOOTNOTE

1. The validity of this assumption of course depends on the nature of the change in the system of unemployment compensation. It is interesting to consider a particular case, suggested by the analysis in Albrecht and Axell (1984). A selective increase in unemployment compensation made available only to those who initially have low (or no) benefits would imply that w^*_{wb} is significantly negative and, correspondingly (by equation (8)), w^{**}_b will be significantly positive. One could actually imagine that the effect of such a selective increase in unemployment compensation would be to reduce the equilibrium rate of search unemployment. The intuition is as follows. Individuals with low initial unemployment compensation will on average be those with low initial reservation wages. When these individuals increase their reservation wages, low-wage firms will be induced to increase their wage offers. On the other hand, high-wage firms have no incentive to change their wage offers. Thus, the dispersion of the wage offer distribution is reduced, and this strongly suggests a reduction in the rate of search unemployment.

APPENDIX

Since $w^*(w,b_o) \equiv w$, we have

$$w^*_w(w,b) > 0 \quad \text{if} \quad b \quad \text{is close enough to} \quad b_o \tag{A1}$$

Consider now a change of the unemployment compensation parameter from b_o to b, where b is close to b_o. It follows that an individual's initial reservation wage is at most $w = w^*(w,b_o)$ if and only if his adjusted reservation wage is at most $w^*(w,b)$, i.e.,

$$G(w^*(w,b),b) \equiv G(w,b_o) \tag{A2}$$

if b is close enough to b_o. Differentiating w.r.t. b gives

$$g(w,b_o)w_b^*(w,b_o) + G_b(w,b_o) = 0 \tag{A3}$$

which is equation (6). Similarly, we get

$$f(w,b_o)w_b^{**}(w,b_o) + F_b(w,b_o) = 0 \tag{A4}$$

Differentiation of (1) w.r.t. b gives

$$\frac{dL}{db} = c\int_{-\infty}^{\infty} G_b(w,b)\, f(w,b)\, dw +$$

$$+ c\int_{-\infty}^{\infty} G(w,b)\, f_b(w,b)\, dw \tag{A5}$$

We integrate the last integral by parts:

$$c\int_{\infty}^{\infty} G(w,b)\, f_b(w,b)\, dw = cF_b(\infty,b) -$$

$$-c\int_{-\infty}^{\infty} g(w,b)\, F_b(w,b)\, dw \tag{A6}$$

with a slight abuse of notations. Since we may assume that the distribution of firms' wage offers has bounded support, we see from (A4) that $F_b(\infty,b) = 0$. Thus we get

$$\frac{dL}{db} = c\int_{-\infty}^{\infty} \left[G_b(w,b)f(w,b) - g(w,b)F_b(w,b)\right] dw \tag{A7}$$

If we now use (A3) and (A4) to substitute G_b and F_b we finally get equation (2).

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REFERENCES

Albrecht, J. and B. Axell (1984), An Equilibrium Model of Search Unemployment, Journal of Political Economy 92, no. 5, forthcoming.

Feldstein, M. and J. Poterba (1984), Unemployment Insurance and Reservation Wages, Journal of Public Economics 23, no. 1/2, 141-167.

Rothschild, M. (1973), Models of Market Organization with Imperfect Information: A Survey, Journal of Political Economy 81, 1283-1308.

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