

Lang, Harald

**Working Paper**

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

IUI Working Paper, No. 127

**Provided in Cooperation with:**

Research Institute of Industrial Economics (IFN), Stockholm

*Suggested Citation:* Lang, Harald (1984) : Comment on Feldstein and Poterba's Unemployment Insurance and Reservation Wages, IUI Working Paper, No. 127, The Research Institute of Industrial Economics (IUI), Stockholm

This Version is available at:

<https://hdl.handle.net/10419/95073>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

A list of Working Papers on the last  
pages

No. 127, 1984

**Comment on Feldstein and Poterba's  
"Unemployment Insurance and Reserva-  
tion Wages"**

by  
Harald Lang

This is a preliminary paper. It is intended for private circulation,  
and should not be quoted or referred to in publications without  
permission of the author. Comments are welcome.

July, 1984

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

HARALD LANG\*, The Industrial Institute for Economic and  
Social Research, Stockholm, Sweden.

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 com-  
pensation. Based on this "partial-partial" analysis they  
draw the conclusion that reducing unemployment benefits  
could significantly lower the average duration of unem-  
ployment. 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 Feld-  
stein and Poterba.

---

\* Mailing adress: IUI, Grevgatan 34, 5tr., S-114 53 STOCKHOLM,  
SWEDEN.

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

HARALD LANG, The Industrial Institute for Economic and  
Social Research, Stockholm, Sweden.

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 tacitly 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  $b_0$ , and when  $b=b_0$ , we suppress  $b$  in the notation, e.g.,  $f(w) = f(w,b_0)$ .

Consider an individual whose reservation wage is  $w$  when  $b=b_0$ , 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  $b=b_0$ ) is  $w$ , when the unemployment compensation parameter equals  $b$ . In particular,  $w^*(w,b_0) = w$  and  $w^{**}(w,b_0) = w$ . 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

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

and it is shown in the appendix that

$$\frac{dL}{db} = \int_{-\infty}^{\infty} [w_b^{**} - w_b^*] g(w) f(w) dw, \text{ when } b=b_0 \quad (2)$$

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 negligible 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,  $\lambda$ , can vary across firms.

A firm's maximization problem is then

$$\max_w (\lambda p - w)cG(w,b)$$

The first and second order conditions are

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

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

When  $b=b_0$ , 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

$$\begin{aligned} & -2g(w^{**},b)w_b^{**} - G_b(w^{**},b) + (\lambda p - w^{**})[g_w(w^{**},b)w_b^{**} + g_b(w^{**},b)] = 0 \end{aligned} \quad (5)$$

In the appendix it is shown that at  $b=b_0$

$$G_b(w,b) = -g(w,b)w_b^*(w,b) \quad (6)$$

Differentiating this expression with respect to  $w$  gives

$$g_b(w,b) = -g_w(w,b)w_b^*(w,b) - g(w,b)w_{wb}^*(w,b), \quad b=b_0 \quad (7)$$

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

$$\begin{aligned}
& [2g(w) - (\lambda p - w)g_w(w)]w_b^{**} = \\
& = [g(w) + (\lambda p - w)g_w(w)]w_b^* - (\lambda p - w)g(w)w_{wb}^* \quad (8)
\end{aligned}$$

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  $w_{wb}^* \leq 0$ . Non-negative profits require  $\lambda p - w \geq 0$ ; thus, from equation (8)

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

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

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

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

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

Thus, given the above assumptions, one can hardly say that  $w_b^{**}$  is negligible 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  $w^*(w, b_0) \equiv w$ , we have

$$w_w^*(w, b) > 0 \quad \text{if } b \text{ is close enough to } b_0 \quad (\text{A1})$$

Consider now a change of the unemployment compensation parameter from  $b_0$  to  $b$ , where  $b$  is close to  $b_0$ . It follows that an individual's initial reservation wage is at most  $w = w^*(w, b_0)$  if and only if his adjusted reservation wage is at most  $w^*(w, b)$ , i.e.,

$$G(w^*(w, b), b) \equiv G(w, b_0) \quad (\text{A2})$$

if  $b$  is close enough to  $b_0$ . Differentiating w.r.t.  $b$  gives

$$g(w, b_0) w_b^*(w, b_0) + G_b(w, b_0) = 0 \quad (A3)$$

which is equation (6). Similarly, we get

$$f(w, b_0) w_b^{**}(w, b_0) + F_b(w, b_0) = 0 \quad (A4)$$

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

$$\begin{aligned} \frac{dL}{db} &= c \int_{-\infty}^{\infty} G_b(w, b) f(w, b) dw + \\ &+ c \int_{-\infty}^{\infty} G(w, b) f_b(w, b) dw \end{aligned} \quad (A5)$$

We integrate the last integral by parts:

$$\begin{aligned} c \int_{-\infty}^{\infty} G(w, b) f_b(w, b) dw &= cF_b(\infty, b) - \\ &- c \int_{-\infty}^{\infty} g(w, b) F_b(w, b) dw \end{aligned} \quad (A6)$$

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

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

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

#### ACKNOWLEDGEMENT

I wish to thank James W. Albrecht for his detailed comments on the editing of this paper.

#### 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.

WORKING PAPERS (Missing numbers indicate publication elsewhere)

1976

1. Corporate and Personal Taxation and the Growing Firm  
by Ulf Jakobsson
8. Estimation and Analysis with a WDI Production Function  
by Göran Eriksson, Ulf Jakobsson and Leif Jansson

1977

15. Pay Differentials between Government and Private Sector  
Employees in Sweden  
by Siv Gustafsson

1980

25. On Unexplained Price Differences  
by Bo Axell
34. Imperfect Information Equilibrium, Existence, Configuration  
and Stability  
by Bo Axell

1981

36. Energi, stabilitet och tillväxt i svensk ekonomi (Energy,  
Stability and Growth in the Swedish Economy)  
by Bengt-Christer Ysander
38. Utility in Local Government Budgeting  
by Bengt-Christer Ysander
40. Wage Earners Funds and Rational Expectations  
by Bo Axell
42. The Structure of the ISAC Model  
by Leif Jansson, Tomas Nordström and Bengt-Christer  
Ysander
43. An Econometric Model of Local Government and Budgeting  
by Bengt-Christer Ysander
44. Local Authorities, Economic Stability and the Efficiency of  
Fiscal Policy  
by Tomas Nordström and Bengt-Christer Ysander
45. Growth, Exit and Entry of Firms  
by Göran Eriksson

56. Central Control of the Local Government Sector in Sweden  
by Richard Murray
59. Longitudinal Lessons from the Panel Study of Income  
Dynamics  
by Greg J. Duncan and James N. Morgan

1982

61. Var står den nationalekonomiska centralteorin idag?  
av Bo Axell
63. General Search Market Equilibrium  
by James W. Albrecht and Bo Axell  
General Equilibrium without an Auctioneer  
by James W. Albrecht, Bo Axell and Harald Lang
64. The Structure and Working of the ISAC Model  
by Leif Jansson, Thomas Nordström and Bengt-Christer  
Ysander
65. Comparative Advantage and Development Policy Twenty  
Years Later  
by Anne O. Krueger
67. Computable Multi-Country Models of Production  
and Trade  
by James M. Henderson
69. Relative Competitiveness of Foreign Subsidiary Operations  
of a Multinational Company 1962-77  
by Anders Grufman
71. Technology, Pricing and Investment in Telecommunications  
by Tomas Pousette
72. The Micro Initialization of MOSES  
by James W Albrecht and Thomas Lindberg
75. The MOSES Manual  
by Fredrik Bergholm
76. Differential Patterns of Unemployment in Sweden  
by Linda Leighton and Siv Gustafsson
77. Household Market and a Nonmarket Activities (HUS)  
- A Pilot Study  
by Anders Klevmarken

1983

79. Energy Prices, Industrial Structure and Choice of Technology; An International Comparison with Special Emphasis on the Cement Industry  
by Bo Carlsson
81. ELIAS - A Model of Multisectoral Economic Growth in a Small Open Economy  
by Lars Bergman
84. Monopoly and Allocative Efficiency with Stochastic Demand  
by Tomas Pousette
86. The Micro (Firm) Foundations of Industrial Policy  
by Gunnar Eliasson
87. Excessive Government Spending in the U.S.: Facts and Theories  
by Edward M. Gramlich
88. Control of Local Authority Expenditure - The Use of Cash Limits  
by Noel Hepworth
89. Fiscal Containment and Local Government Finance in the U.K.  
by Peter Jackson
90. Fiscal Limitations: An Assessment of the U.S. Experience  
by Wallace E. Oates
91. Pricing and Privatization of Public Services  
by George E. Peterson
94. Job Mobility and Wage Growth:  
A Study of Selection Rules and Rewards  
by Bertil Holmlund
96. The Machine Tool Industry - Problems and Prospects in an International Perspective  
by Bo Carlsson
97. The Development and Use of Machine Tools in Historical Perspective  
by Bo Carlsson
99. An Equilibrium Model of Search Unemployment  
by James W. Albrecht and Bo Axell
100. Quit Behavior under Imperfect Information: Searching, Moving, Learning  
by Bertil Holmlund and Harald Lang

102. Collecting Data for Micro Analysis.  
Experiences from the Hus-Pilot Study  
by N. Anders Klevmarcken
103. The Swedish Micro-to-Macro Model  
- Idea, Design and Application  
by Gunnar Eliasson
105. Estimation of Wage Gains and Welfare Gains from  
Self-Selection Models  
by Anders Björklund and Robert Moffitt
106. Public Policy Evaluation in Sweden  
by Bengt-Christer Ysander
108. Entry, Industry Growth and the Microdynamics  
of Industry Supply  
by John C. Hause and Gunnar Du Rietz
109. Capitalist Organization and Nationalistic Response;  
Social Dynamics in Age of Schumpeter  
by William Parker
110. A Nonwalrasian Model of the Business Cycle  
by J.-P. Benassy
111. Disequilibrium Economic Dynamics -  
A Post-Schumpeterian Contribution  
by Richard Day
112. Schumpeterian Competition in Alternative Technological  
Regimes  
by Sidney Winter
113. The Industrial Finance Systems; Europe, U.S. and Japan  
by Tad Rybczynski
114. The Microeconomics of Organization and Productivity  
Change - The Use of Machine Tools in Manufacturing  
by Bo Carlsson
115. On the Behavioral and Rational Foundations of Economic  
Theory  
by Herbert Simon
116. Schumpeterian Dynamics  
by Erik Dahmén
117. Micro Heterogeneity of Firms and the Stability of Industrial  
Growth  
by Gunnar Eliasson
118. The Initialization Process - The Moses Manual, Part 2  
by Fredrik Bergholm

1984

119. Forestalling the Demise of Empirical Economics: The Role of Microdata in Labor Economics Research  
by Frank Stafford
120. Unemployment and Mental Health - Some Evidence from Panel Data  
by Anders Björklund
121. Comparative Keynesian Dynamics  
by Richard H. Day
122. The Firm and Financial Markets in the Swedish Micro-to-macro model (MOSES)  
- Theory, model and Verification  
by Gunnar Eliasson
123. What Can Be Learned from the Chrysler Experience?  
by Frank Stafford
124. Prisstabilisering genom skattebaserad inkomstpolitik  
av Bengt-Christer Ysander
125. Estimates of Bounds for Export Price Elasticities in an Underidentified Simultaneous Two Equation System  
by Eva Christina Horwitz
126. An Easy Fixup of the Flaw in Lucas' "Neutrality of Money"  
by Harald Lang
127. Comment on Feldstein and Poterba's "Unemployment Insurance and Reservation Wages"  
by Harald Lang