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International Economic Review, Volume 27, Issue 1 (Feb., 1986), 175-185.

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International Economic Review

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UNEMPLOYMENT INSURANCE AND THE ENTITLEMENT
EFFECT: A TAX INCIDENCE APPROACH*BY JOHN M. BARRON, R. PRESTON MCAFEE
AND PAUL J. SPEAKER¹

1. INTRODUCTION

Standard analysis of the effects of a change in a tax or subsidy begins by characterizing the responses of individuals to the tax or subsidy change. The implications for market prices are then considered. Finally, questions of tax incidence are explored.² In contrast to the three step analysis of the tax incidence literature, recent analysis of the effects of a change in unemployment insurance (a subsidy to the unemployed) stops with the characterization of the responses of individuals to the subsidy change. Papers by Burdett [1979] and Hamermesh [1980] are examples of analysis where attention is placed solely on individual responses to changes in unemployment insurance (UI) benefits. They find that for individuals currently out of the labor force, an increase in UI benefits raises the likelihood of participation in the labor force. For individuals currently in the labor force who are unemployed and not receiving UI benefits, higher UI benefits reduce the duration of unemployment by lowering reservation wages. These effects on labor supply are called the "entitlement" effects of a change in UI benefits.

The purpose of this paper is to extend the work of Hamermesh [1980] and Burdett [1979] to investigate the effects of changes in UI benefits when market price adjustments are considered.³ However, doing this is more than a simple application of standard tax incidence analysis. The analysis is complicated since individual responses to UI benefit changes are in the context of optimal search behavior. Thus, the introduction of market considerations requires a characterization of the labor market in terms of an equilibrium compensation *distribution*. The ultimate consequences of changes in UI benefits now involve not only the effect on labor supply (specifically, labor force participation) but also the effects on the search behavior of the currently unemployed, including the effect on the duration of unemployment, and potential effects on the characteristics of employers.

* Manuscript received July, 1983; revised April, 1985.

¹ We wish to thank the editor and referees for valuable comments on an earlier draft of this paper.

² Atkinson and Stiglitz [1980] present the standard analysis of the effects of a tax change in both a partial and a general equilibrium setting.

³ Hamermesh [1980, p. 517] notes that his discussion of entitlement effects "ignore(s) the financing of UI benefits and the possibility that shifting the payroll tax for UI onto labor may affect supply behavior".

Section 2 develops a model of a labor market for new entrants to the labor force. The market has an endogenous compensation distribution for reasons outlined by MacMinn [1980]. In Section 3, we investigate the effects of various changes in UI benefits on the compensation offer distribution, labor supply, the duration of unemployment, and the characterization of employers. In doing so, we consider the implications of institutional peculiarities of unemployment insurance in the U. S. Specifically, we consider the implications of the tax-exempt nature of UI benefits and the fact that UI payments are not perfectly experience-rated across employers. Section 4 summarizes our findings and contains concluding remarks. To anticipate, we find that the entitlement effects of UI benefits are not easily obtainable in a more general setting.

It is important to note at the outset that our analysis considers the effect of UI insurance on the labor market for new entrants. To focus on this, it is assumed that once employment is accepted, workers remain with the firm, although temporary unemployment spells are experienced. One effect of a change in UI payments not considered is a change in the frequency of unemployment spells when UI benefits are tax exempt or when UI taxes are not perfectly experience-rated.⁴ A second potential effect of a change in UI benefits that is not addressed is the effect on the search behavior of those currently receiving such benefits.⁵

2. THE EQUILIBRIUM COMPENSATION DISTRIBUTION

To analyze the effects of UI insurance in a market setting, we characterize in this section the equilibrium compensation offer distribution when there is heterogeneity across both employers and job seekers. The section is divided into four parts. Section 2.1. characterizes the optimal wage selected by an employer maximizing discounted profits. In the process, a stochastic demand constraint is introduced in order to generate layoffs accompanied by UI payments.⁶ The optimal search behavior of an unemployed individual is presented in Section 2.2. The unemployed choose reservation compensation packages to maximize discounted expected returns to search. The analysis focuses on the search and labor supply decisions of new entrants in order to highlight the entitlement effect of UI benefits. In Section 2.3, a supply of labor function when job seekers differ in search costs is obtained. This supply function is time specific due to the addition to MacMinn's analysis of a discount factor. Finally, Section 2.4 derives the equilibrium compensation offer distribution with the introduction of employers who differ in labor productivity.

2.1. *Employer Behavior.* Let labor be the only variable input in the produc-

⁴ See Feldstein [1976] for a discussion on this point.

⁵ See Lippman and McCall [1976] for a discussion of these effects.

⁶ We also expand upon the work of MacMinn [1980] in indicating the role of certain steady state assumptions in deriving employers' profits in terms of the labor supply behavior of the cohort of individuals currently entering unemployment.

tion process, with y denoting the constant average product of labor for an employer. At any time t , the employer has a labor force inherited from hiring activity in previous periods. Two decisions are made by the employer at time t . One decision concerns the output to be produced during the period. The second decision concerns the hiring of new employees during the period to augment production in subsequent periods.

Since the labor force for the current period is given, the output decision for the period depends solely on which of two states of the world characterize the output market at time $t+1$. In state one, all output produced during the period can be sold at time $t+1$ at a fixed price normalized to one. In state two, only a fraction $(1-\theta)$ of the output that could be produced during the period by the employer's work force can be sold at the fixed price. States of the world at time $t+1$ are known to the employer at time t .

At time t , the employer does not know which state of the world will exist at time $t+2$ and beyond. Thus, new employees hired during the period are offered employment contracts that specify with probability $1-\theta(1-p)$ the receipt of a fixed real wage w at the end of each subsequent period, where p denotes the probability that state one occurs. Each period with probability $\delta=\theta(1-p)$, the individual is (temporarily) laid off and receives real unemployment insurance payment UI .⁷ The expected compensation each period associated with the offer of employment is, then, $x=(1-\delta)w+\delta UI$.

An individual hired during the period $(t, t+1)$ has a constant probability q of leaving the employer (and the labor force) at the end of any period.⁸ Letting r denote the interest rate and letting $\alpha=(1-q)/(1+r)$ denote the discount factor, the net return to the employer for each new employee hired during a particular period, evaluated in terms of the start of the period in which the individual is hired, is given by

$$(1) \quad R = \sum_{v=1}^{\infty} (1-\delta)(y-w-\beta)\alpha^v(1/1+r) \\ = [(1-q)/(1+r)(r+q)](1-\delta)(y-w-\beta),$$

where β is a tax per employee.

Let $s_{t+n}^t(x)$ define the expected number of individuals from the cohort who enter unemployment at time t who are hired during the period $(t+n, t+n+1)$ by the

⁷ We assume employees are homogenous and output cannot be stored so that the output constraint determines the fraction of the labor force laid off and every employee faces a common probability of being laid off during the period $(t, t+1)$ if state two occurs. Note that, as Mortensen [1978] has pointed out, the contract form offered is optimal if "a combination of periodic vacations and work periods at longer hours per week is preferred to continuous work at a smaller number of hours per week" (p. 15).

⁸ We assume q is the same for all potential employees. The assumption of a positive q is necessary to assure that, for each employer, there exists a finite steady state level of employment, where new hires each period equal the number of current employees who leave. That some individuals (either unemployed or employed) exit the labor force each period also assures a finite steady state level of employment and unemployment in an economy in which new entrants to the labor force occur each period.

employer. For the cohort entering at time 0, the employer's present value of net returns to hiring from this cohort is then given by

$$(2) \quad \pi(0) = [\sum_{n=0}^{\infty} (1/(1+r)^n s_n^0(x))]R.$$

Assume that identical cohorts of individuals enter unemployment each period and that an identical group of employers seek to hire each period. Under these stationarity assumptions, $s_n^0(x)$ equals $s_{t+n}^t(x)$ for all t . In such a case, the employer's present value of net returns to hiring from the cohorts of workers entering at times 0, 1, 2, 3, ... is given by

$$(3) \quad \pi = \sum_{t=0}^{\infty} \{(1/(1+r))^t [\sum_{n=0}^{\infty} (1/(1+r))^n s_n^0(x)]\}R.$$

We assume the wage w , and thus expected compensation x , are chosen by the employer to maximize π .⁹ To characterize the optimal choice of w , one must obtain an explicit expression for the labor supply of cohorts entering unemployment. We now turn to a discussion of the cohort entering unemployment in period zero.

2.2. Unemployed Search Behavior. Consider an individual who enters unemployment in period zero. Let c denote the cost incurred at the start of each period to sample during the period one employer offering a wage w and a probability of layoff δ . Assuming risk neutrality, the searcher may take expected compensation $x = (1-\delta)w + \delta UI$ as his observation.¹⁰ Let $F(x)$ denote the compensation offer distribution. Assuming a continuum of employers defined over the set $[0, 1]$, $F(x)$ is a continuous distribution function. The optimal reservation compensation package, ε , is given by the equation:¹¹

$$(4) \quad c = \{1/(1+r)(r+q)\} \left[\int_{\varepsilon}^{\bar{x}} (1-q)(x-\varepsilon)dF(x) - (r+q)\varepsilon \right] \equiv g(\varepsilon).$$

From equation (4), it can be shown that the reservation compensation ε , and thus the expected gain to search, are inversely related to c . Further, the entitlement effect as suggested by Burdett [1979] and Hamermesh [1980] exists.¹² That is,

⁹ Note that since the demand constraint on output in state two is proportional to the size of an employer's work force, the probability of a layoff given state two occurs is independent of the wage choice.

¹⁰ There are several ways of incorporating UI into the expected gain to accepting an employment offer. Burdett assumes that an individual is terminated after a random length of employment and not rehired. In contrast, we follow Feldstein [1976] in assuming that each period there is a positive probability the individual is temporarily laid off. Note that we do follow Burdett [1979], and simplify exposition in doing so, by assuming an infinite time horizon, though the expected length of time in the labor force for each individual is finite.

¹¹ Equation (4) derives from an objective function for the searcher (the expected present value of search) of the form

$$V = \{(1+r)/(r + \Pr(x \geq \varepsilon) + q(1 - \Pr(x \geq \varepsilon)))\} [-c + \{(1-q)/(r+q)(1+r)\} E(x | x \geq \varepsilon)].$$

From equation (4) we have that $g'(\varepsilon) = -[1 - F(\varepsilon)(1-q) + r]$.

¹² Had we followed Burdett in assuming periods of employment were followed by permanent layoffs, an entitlement effect would occur only if $q > 0$.

for individuals not currently receiving UI payments, an increase in UI payments increases ε by shifting to the right the distribution of compensation offers by δdUI . But since the increase in ε will be less than δdUI , the expected duration of unemployment falls. The change in UI payments also alters the labor supply of a cohort. Let V_0 denote the common value of non-market activity for individuals in the cohort. For a given UI payment, individuals in the cohort with search costs such that $c > c_0$ ($\varepsilon < \varepsilon_0$) have an expected gain to search less than the alternative value of non-market activity, V_0 . Such individuals do not participate in the labor market. Since an increase in UI payments increases ε , such an increase raises labor supply in terms of the number of individuals in the cohort who choose to search ($\varepsilon > \varepsilon_0$).

2.3. *The Supply Function.* Let $[0, 1]$ denote the set of individuals who can enter unemployment at time zero. Assume search costs c are uniform on the interval $[\underline{c}, \bar{c}]$, with $k = \bar{c} - \underline{c}$.¹³ Since individuals with $\varepsilon < \varepsilon_0$ do not search, the lowest compensation offered by an employer who is hiring, \underline{x} , is such that $\underline{x} \geq \varepsilon_0$. No employer gains by offering a compensation package above the highest reservation compensation, which is chosen by individuals with search cost \underline{c} . Thus, from equation (4), $\bar{x} \leq g^{-1}(c)$.

Let $F_n(x|x \geq \varepsilon)$ define the probability that an individual who enters unemployment at time zero with reservation compensation ε accepts employment at compensation less than or equal to x in period n . That is,

$$\begin{aligned}
 (5) \quad F_n(x|x \geq \varepsilon) &= \frac{\Pr(\varepsilon \leq X \leq x)}{\Pr(X \geq \varepsilon)} \Pr(X \geq \varepsilon) (\Pr(X < \varepsilon)(1-q))^n & x \geq \varepsilon \\
 & n = 0, 1, \dots \\
 &= [F(x) - F(\varepsilon)] [F(\varepsilon)(1-q)]^n. & x \geq \varepsilon \\
 & n = 0, 1, \dots
 \end{aligned}$$

Job seekers with $\varepsilon > x$ have a zero probability of supplying labor at a compensation no greater than x . These individuals have costs c such that $c = g(\varepsilon) < g(x)$. Individuals with $c > g(\varepsilon_0)$ do not enter unemployment. Thus the expected total number of individuals that enter unemployment at time zero who accept employment in period n at compensation no greater than x , $TS_n^0(x)$, is given by

$$(6) \quad TS_n^0(x) = (1/k) \int_{g(x)}^{g(\varepsilon_0)} F_n(x|x \geq g^{-1}(c)) dc.$$

Substituting equation (5) into equation (6) and differentiating with respect to x , one obtains the expected labor supply at compensation x at time n with respect to

¹³ For $r+q > 0$ and a continuum of employers, we assume negative search costs for some individuals such that there are some individuals who would accept only the highest compensation package. This restrictive assumption follows from the assumption of a continuum of employers and searchers. With a finite number of employers and searchers, the assumption that search costs be negative for some is not necessary.

those entering at time zero, $S_n^0(x)$. With a change in variables from c to ε ,

$$(7) \quad S_n^0(x) = (f(x)/k(1+r)(r+q)) \int_{\varepsilon_0}^x [F(\varepsilon)(1-q)]^n [1-F(\varepsilon)(1-q)+r] d\varepsilon.$$

The expected number of this cohort hired by a particular employer with compensation x at time n , $s_n^0(x)$, is then

$$(8) \quad s_n^0(x) = S_n^0(x)/f(x).$$

2.4. The Wage Offer Distribution. Let us assume that all employers share a common probability of layoff, δ , and a common tax payment, β . However, following MacMinn [1980], employers do differ in the average product of labor, y . Let $H(y)$ denote the distribution function of productivities of employers defined over the set $[y, \bar{y}]$ with h as the probability density function. The expected labor supply function in period n for individuals who entered unemployment n periods ago is zero for all n when $x \leq \varepsilon_0$. Thus, from the employer's profit function we observe that employers with $y < \beta + (\varepsilon_0 - \delta UI)/(1 - \delta)$ do not participate in the labor market.

While the distribution of productivities across employers is given, the unemployment insurance program and the implied imposition of taxes by government to pay for such programs alters the distribution of net productivities across employers. Let $z = (1 - \delta)(y - \beta) + \delta UI$ denote the net productivity of a particular employer, with distribution function $J(z)$ defined over the set $[z, \bar{z}]$ with j as the probability density function. Then, since the set of employers each period is denoted by $[0, 1]$, $[1 - J(\varepsilon_0)]$ represents the employers that are hiring. In the following, it is assumed that $z < \varepsilon_0$, so that some employers are not hiring.

Assume a one-to-one mapping Φ of net productivity to compensation.¹⁴ Then, from MacMinn's [1980] remark 1, the compensation distribution is given by

$$(9) \quad f(x) = j(\varphi(x))\varphi'(x)/(1 - J(\varepsilon_0)),$$

for x an element of $\Phi(Z_0)$, where $Z_0 = [\max(z, \varepsilon_0), \bar{z}]$ is the set of net productivities for employers in the market. It is zero otherwise.

The objective function for the maximization problem of the employer is given by (3). Substituting equation (8) into (3) and maximizing with respect to w yields the

¹⁴ Note that in deriving a continuous non-trivial compensation distribution, MacMinn [1980] argues that the assumptions of job seekers with different search costs and employers with different productivities imply a one-to-one mapping Φ such that $\Phi: z \rightarrow x$ with $\varphi = \Phi^{-1}$. However, these assumptions are not sufficient to imply a one-to-one mapping Φ since a single common compensation package would be consistent with maximizing behavior of all parties. This result is due to there being a continuum of employers and employees. A one-to-one mapping with Φ increasing does emerge from maximizing behavior in the case of a finite number of heterogeneous employers and employees. With a finite number of employers and employees, a change in the compensation offer of a single employer now alters the compensation offer distribution, affecting the optimal search behavior of individuals and that employer's labor supply. See Carlson and McAfee [1983].

first order condition $[z - x] - [x - \varepsilon_0] = 0$.¹⁵ Thus

$$(10) \quad \varphi(x) = 2x - \varepsilon_0.$$

For those with the lowest reservation compensation, ε_0 , we have $\varepsilon_0 = (r + q)V_0$, where V_0 denotes the common value of non-market activity. From equations (9) and (10), the equilibrium compensation density function is then given by

$$(11) \quad f(x) = 2j(2x - (r + q)V_0) / (1 - J((r + q)V_0)),$$

for x and element of $\Phi(Z_0)$, zero otherwise. The equilibrium wage offer density function, $f^*(w)$, is then

$$(12) \quad f^*(x) = f((1 - \delta)w + \delta UI)$$

for w an element of $\Phi^*(Z_0)$, where $\Phi^*(z) = (\Phi(z) - \delta UI) / (1 - \delta)$.

3. UNEMPLOYMENT INSURANCE AND LABOR SUPPLY

A complete analysis of the effect of an increase in UI on search behavior and labor force participation requires both that the wage offer distribution be endogenous and that one consider how such payments are financed. To assess the sensitivity of the analysis to each of these considerations when there is an increase in UI payments, we consider five separate cases that differ by the method of funding and by the source of heterogeneity among firms.

Case 1: The first case follows the analysis in the previous section in assuming each employer's compensation offer involves the same probability of being laid off. Further, it is assumed that each employer pays a tax per employee exactly equal to expected UI payments. Formally, we have

THEOREM 1. *Suppose all firms experience a given $\delta \in (0, 1)$ and*

$$(13) \quad \beta = \delta UI / (1 - \delta).$$

Then the duration of unemployment, the compensation distribution, and the entry decision of new workers are invariant to changes in UI.

PROOF. If $\beta = \delta UI / (1 - \delta)$, then the distribution of employer productivities $z = (1 - \delta)(y - \beta) + \delta UI$ is invariant to changes in UI. Consequently, by (11), the distribution of compensation is invariant. By (4), search behavior is invariant.

In this case, there is single effect of a change in UI; namely a change in the form of compensation. With an increase in UI, wages fall.

Case 2: One unrealistic feature of the analysis in case 1 is that employers are identical in layoff probabilities. A second unrealistic feature of the analysis is the assumption that each employer pays UI taxes that reflect his layoff experience.

¹⁵ In substituting equation (8) into (3), note that

$$\sum_{n=0}^{\infty} [F(\varepsilon) (1 - q)]^n [1 / (1 + r)]^{n+1} [1 - F(\varepsilon) (1 - q) + r] = 1.$$

We now consider two cases in which one and then both of these features are eliminated. In Case 2, we presume a given value of y but that δ has a distribution $H(\delta)$ on $[0, 1]$. That is, employers differ in layoff probabilities. However, Case 2 assumes that each employer pays a tax equalling the expected UI benefits of one of his employees. This is termed the “perfectly experience-rated” case.¹⁶ Case 3 is like Case 2 except that employers with different layoff probabilities are now assumed to pay the same tax per employee. This is termed the “imperfectly experience-rated” case. In both cases, it is assumed that $y > UI + \beta$.

For the “perfectly experience-rated” case, we obtain the following theorem:

THEOREM 2. *If each firm with layoff probability δ pays a tax given by (13), then the duration of unemployment, the entry decision, and the compensation distribution are invariant to changes in UI.*

PROOF. From (13), net productivity z is given by $z = (y - \beta)(1 - \delta) + \delta UI = (1 - \delta)y$. Consequently, changes in UI do not change the distribution of productivities, and the theorem follows from (11) and (4).

Thus, as in Case 1, the result is no effect from changes in UI benefits other than that higher UI benefits imply lower wage offers by employers with positive probabilities of layoff.

Case 3: Consider now the effect of an increase in UI benefits for the imperfectly experience-rated case, where employers with different layoff probabilities pay a common UI tax. In this case, to consider the effect of a change in UI we first derive the relationship between the average (common) tax and expected UI payments that is consistent with complete funding of the UI program. Formally, we have:

THEOREM 3. *Assuming a uniform distribution of layoff probabilities δ on $[0, 1]$ and $r = 0$, then for the insurance premium budget to balance we have*

$$(14) \quad UI = \{[2(y - \beta) + \varepsilon_0]\beta\} / (y + 2\beta - \varepsilon_0).$$

PROOF. Given a uniform distribution for δ on $[0, 1]$, an employer’s net productivity $z = (y - \beta)(1 - \delta) + \delta UI$ has a distribution

$$(15) \quad J(z) = (z - UI) / (y - UI - \beta), \quad UI \leq z \leq y - \beta.$$

From equations (7), (8), (11), and (15), the number of workers attached to a given employer with compensation x is

$$\begin{aligned} N(x) &= \sum_{v=0}^{\infty} [\sum_{n=0}^{\infty} s_n^0(x)] (1 - q)^v, \\ &= \{1 / [(qk)(1 - r)(r + q)]\} \int_{\varepsilon_0}^x [1 - F(\varepsilon)(1 - q) + r] / [F(\varepsilon)(1 - q)] d\varepsilon. \end{aligned}$$

¹⁶ In an earlier draft of this paper, we considered the case where taxes varied across employers — although they had a common probability of layoff. In this case, we found that an increase in UI payments financed by an increase in the maximum tax payment would increase the duration of unemployment. The effect on labor supply was, however, ambiguous.

Given $r=0$, we have

$$(16) \quad N(x) = (x - \varepsilon_0)/q^2k.$$

Solving for δ from $z=(y-\beta)(1-\delta)+\delta UI$ in light of (10) yields

$$(17) \quad \delta = \{y - \beta + \varepsilon_0 - 2x\} / \{y - \beta - UI\}.$$

Finally, a balanced budget requires

$$(18) \quad \beta = \left(\int_{\varepsilon_0}^{\bar{x}} N(x)\delta UI dx \right) / \left(\int_{\varepsilon_0}^{\bar{x}} N(x)(1-\delta) dx \right),$$

and (16), (17), and (18) yield (14) as desired.

Given the above relationship between UI changes and changes in the common tax, we are now ready to state the effect of changes in UI for the imperfectly experience-rated case. Formally, we have:

THEOREM 4. *Suppose $UI < \varepsilon_0 < y - \beta$ and the conditions of Theorem 3 are met. Consider a searcher at a given level of UI. If UI is increased and the searcher stays in the market, he will have reduced expected compensation and reduced duration of unemployment. The increase in UI reduces the number employed, as labor force participation decreases.*

PROOF. By theorem 3, $d\beta/dUI > 1$ for $UI < \varepsilon_0 < y - \beta$. It follows from (4), (11), and (15) that the reservation compensation ε , which is expected compensation, diminishes, and further that $[1 - F(\varepsilon)]^{-1}$, the expected number of searches, decreases. Finally, by (4) it follows that the maximum search cost for which search is optimal falls.

The change in UI benefits affects not only workers but the composition of employers. When higher UI benefits are paid for by a higher common tax on employers, employment at firms with a high probability of layoff increases relative to those at low probability firms, and new, high layoff probability firms enter the labor market.

Case 4: In the above cases, the tax financing of UI benefits was explicitly considered. Yet, as Atkinson and Stiglitz [1980] note, the tax incidence literature often analyzes tax (subsidy) changes without considering explicitly the financing constraint of the government.¹⁷ In the next two cases we consider an increase in UI payments that is not paid for by an employer tax.¹⁸ Case 4 is identical to cases 2 and 3 in that it involves employers with identical average productivity y who differ in layoff probabilities. Case 5 involves employers with identical layoff

¹⁷ Specifically, Atkinson and Stiglitz [1980, p. 162] state that "in the (tax incidence) analysis we try to focus attention on the tax or expenditure in question by "neutralizing" the other effects".

¹⁸ An analysis of changes in UI benefits that ignores the tax financing of UI benefits may not be as myopic as it first appears if one recognizes, as did Feldstein [1976], the positive net gain to employers and employees of using UI programs coupled with unemployment periods to avoid income taxes.

probabilities who differ in average productivity y . For case 4 we have:

THEOREM 5. *Suppose employers have a common productivity, y , but layoff probabilities are distributed uniformly on the interval $[0, 1]$. If UI is increased and β left invariant, then labor force participation and the duration of unemployment is unchanged. However, new high layoff employers enter and average productivity diminishes.*

PROOF. From (11) and (15), one obtains $f(x) = 2/(y - \varepsilon_0 - \beta)$, with $\varepsilon_0 \leq x \leq y - \beta$. Thus the search behaviour is invariant. However, by (17), the maximum feasible δ with compensation at least ε_0 rises, admitting more firms and reducing average productivity.

Thus, an increase in non-tax financed UI payments alters neither labor force participation nor the expected duration of search. What does occur is a shift in the composition of employers, and employment at employers with high layoff probabilities increases.

Case 5: Finally, consider the case in which employers who do not pay UI taxes have a common probability of layoff but differ in average productivity. To parallel case 4, assume the distribution of y is uniform on the interval $[\underline{y}, \bar{y}]$, such that, like case 4, the distribution of net productivities is uniform. Further, let $\varepsilon_0 > (1 - \delta)\underline{y} + \delta UI$, so that some employers are not hiring. We then have:

THEOREM 6. *Suppose y has a uniform distribution on $[\underline{y}, \bar{y}]$ and $\delta \in (0, 1)$ is fixed. Let $\varepsilon_0 > (1 - \delta)\underline{y} + \delta UI$. If UI is increased with β invariant, mean compensation, employment, and the expected duration of unemployment increase.*

PROOF. The increase in UI shifts the productivity distribution J rightward. This, by (11), shifts the compensation distribution and spreads it as $1 - J((r + q)V_0)$ diminishes. The effect on expected duration follows from (4). Labor force participation increases due to the rise in the mean expected compensation. This occurs since, unlike the prior case, employers offering the highest compensation are now affected. For individuals in the cohort entering unemployment at the time higher UI benefits are announced, the expected duration of search increases due to the increase in dispersion of the compensation distribution.

4. SUMMARY AND CONCLUDING REMARKS

This paper has examined the effects of unemployment insurance on the labor market for new entrants. It is shown that if one takes into account the tax financing of benefits and the endogeneity of the wage offer distribution, then an increase in expected UI benefits does not alter either the expected duration of unemployment or labor supply when taxes are perfectly experience-rated. An increase in UI benefits does, however, lead to a downward shift in the wage offer distribution, such that expected total compensation for accepting an employment offer is unchanged.

If tax financing of UI benefits is not perfectly experience-rated, or if the tax source of UI benefits is not considered, then an increase in UI benefits can affect the mean compensation offer, the expected duration of unemployment for an entering cohort, labor force participation, and the composition of employers. Under certain situations, it can be shown that if UI taxes are imperfectly experience-rated, an increase in UI benefits does decrease the expected duration of unemployment for those currently searching. However, such an increase in UI also reduces the rate at which individuals enter unemployment and thus the size of the labor force since it reduces the mean compensation offer. Further, it increases relative employment at firms with greater probabilities of layoff. This increases the proportion of employed who are on temporary layoff in any given period.

If one ignores the tax financing of an increase in UI benefits, the inclusion of an endogenous wage offer distribution can still generate results different from others. Specifically, the effect of an increase in UI benefits on labor supply and the expected duration of unemployment for an entering cohort depends on the source of heterogeneity across employers. If employers differ in the average productivity of new hires, then an increase in UI payments can increase labor force participation but it also can raise the expected duration of search for those whose decision to participate in the labor force was not a result of the increase in UI payments.

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