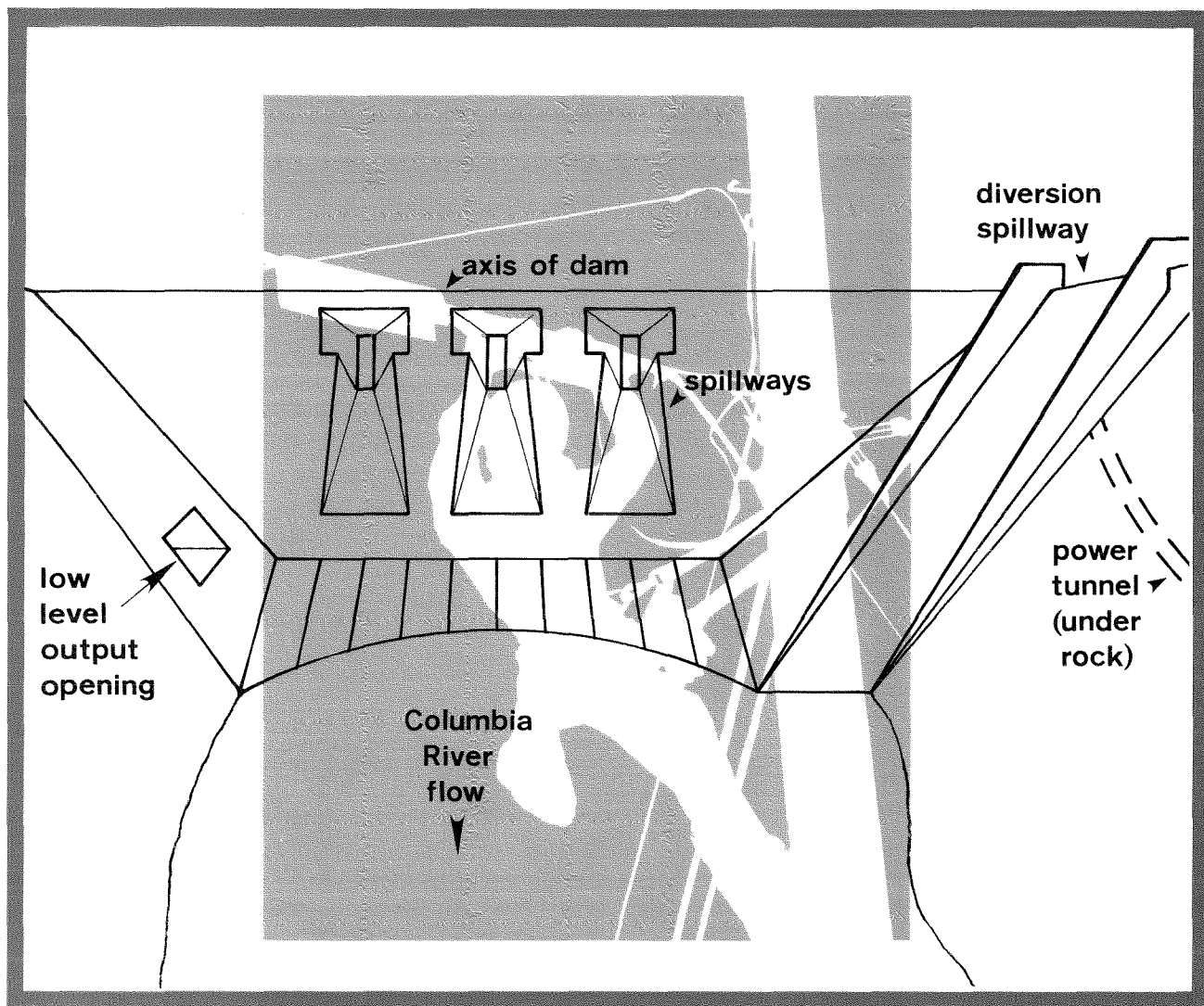


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Should Discouraged Workers Be Counted in the Labor Force?— A Job-Search Approach

Rose McElhattan*

In the early 1960's, labor-market economists began to focus our attention on the historical correlation between movements in economic activity and the size of the labor force. They found that during economic downturns, sizable numbers of individuals either left the labor force or postponed entering the market, while during the initial phases of business recovery, unusual amounts of workers joined the labor force. These cyclical movements showed the existence of a sizable labor-force reserve, a group of workers willing and available for work according to the state of the economy.

This labor-force reserve posed a special problem for policymakers. During recessionary periods, with some individuals leaving the labor force, the official unemployment rate would not reflect the "true" cyclical amount of unemployment. During the recovery period, in contrast, greater than average increases in the labor force would produce a stickiness in the unemployment rate, preventing it from signaling an improvement in employment and business activity. Consequently, policymakers eventually tried to get better estimates of the size of this labor-force reserve, to determine whether the reserve should be included as part of the official labor force. In 1967, the Census Bureau added a list of questions to the monthly Current Population Survey, to estimate the size of this reserve of "discouraged workers." The survey counts as discouraged those who say they want a job but haven't looked recently because they believe they could not find work even after a job search. On this basis, the availability of a person for work distinguishes

those in the labor-force reserve from other labor market non-participants.

Published analyses of discouraged worker survey data, however, do not provide an unequivocal answer to the question of including such workers in the official labor-force count. For instance, many workers who give personal reasons for their discouragement with job-market prospects appear insensitive to changes in the availability of jobs, and thus do not appear to represent a ready labor-force reserve. A recent study by the National Commission for Employment and Unemployment Statistics recommended that discouraged workers be counted outside the labor force until more could be learned about their availability and commitment to the job market.

The resolution of this issue has major public-policy implications. If discouraged workers were added to the labor force, they would significantly increase the official unemployment rate—from 6.0 percent to 6.8 percent in 1978, for example. Under existing laws, such as the Comprehensive Employment and Training Act (CETA), more Federal funds hence would be allocated to states and localities, as a means of meeting the government's full-employment objectives.

The purpose of this paper is to study discouraged-worker behavior within the framework provided by job-search theory, to shed some light on the job-market availability and commitment of discouraged workers. In its study, the National Commission applied a conventional unemployment model, relating discouragement to changes in the unemployment rate—a proxy for overall labor-market conditions—and a time trend, which proxies for the

*Economist, Federal Reserve Bank of San Francisco.

many other economic and social factors that affect workers' decisions. A job-search model also focuses upon general labor-market conditions (because they are associated with the cost of finding work), but in addition, it focuses on unemployment-insurance benefit payments and on the real wages the individual expects to receive in the market.

I. Characteristics of Discouraged Workers

Discouraged workers are persons who want jobs, but who have not looked for work recently because they believe they would be unsuccessful even if they looked for jobs. These people are not counted as part of the labor force nor of the officially unemployed, because they do not meet the necessary criterion of having actively searched for work in the last four weeks. The U.S. Department of Labor defines "actively searching" rather liberally; it includes registering for work when one collects unemployment-insurance benefits, talking to neighbors about job opportunities, and actually being interviewed.

The Bureau of Labor Statistics has been collecting data on discouraged workers since 1967, through a set of supplementary questions on the monthly Current Population Survey—the source of the basic employment and unemployment data. Questions regarding labor-force non-participation, however, are asked each month of only one-fourth of the sample, and the data are published only as quarterly averages.

For each individual who is not in the labor force during the week the Current Population Survey is taken, two key questions differentiate discouraged workers from others:

1. Does. . . want a regular job now, either full or part-time?
2. What are the reasons. . . is not looking for work?

A person is classified as a discouraged worker if he/she answers yes or maybe to the first question, if his/her major activity during the survey week was not attending school, and if he/she did not seek work because of one of the following reasons:

Section I provides a brief discussion of the survey data and characteristics of discouraged workers. This is followed in Section II by a discussion of the conventional unemployment and job-search models. Section III presents empirical results, and the final section discusses the conclusions of the study.

1. Believes no work available in line of work or area;
2. Could not find any work;
3. Lacks necessary schooling, training, skills, or experience;
4. Employers think too young or too old; or
5. Other personal handicaps (such as discrimination by employers) in finding a job.

No questions are asked regarding the type of work or the pay the individual has in mind. Since these issues are important to a job seeker, analysts generally interpret an individual's belief that no work is available as meaning a belief that no "suitable" work is available.

Other reasons non-participants give for not looking for work—although wanting work—include school attendance, ill health and home responsibilities. A person will be classified as not discouraged, even if giving reasons for discouragement, when other explanations such as home responsibilities or ill health are also given. The object of the classification scheme is to separate those workers who are available for work from those who supposedly are not, since these others have responsibilities or physical handicaps that would keep them from accepting work even if it were available. This availability is at the heart of the contention that discouraged workers should be included in the official labor force.

Most people not in the labor force during the typical survey week in 1978 did not want a job at that time (Table 1). About 5.3 million people reported wanting a job—but only a portion of these, 845,000 persons, offered reasons related to discouragement over job prospects

for not seeking work. Discouraged workers represented 0.5 percent of the population in 1978, and if included in the labor force would have increased the official unemployment rate from 6.0 percent to 6.8 percent.

Discouraged workers who believed that no work was available, or who could not find any work, were classified as discouraged for job-market reasons. The others were classified as discouraged for personal reasons. The number of people giving job-market reasons for discouragement has exceeded those citing personal factors ever since the survey began, except in the very first quarter of 1967 (Chart 1). The number of discouraged for job-market reasons (but not for personal reasons) has generally reflected cyclical movements in labor-market conditions. Since the early 1970's, discouragement for job-market reasons has accounted for between 70 and 80 percent of the total.

Most discouraged workers are female; their share of that total has remained close to two-thirds over the past decade regardless of over-

Table 1
Civilian Employment, Unemployment and Persons Not in the Labor Force, 1978
(thousands of persons)

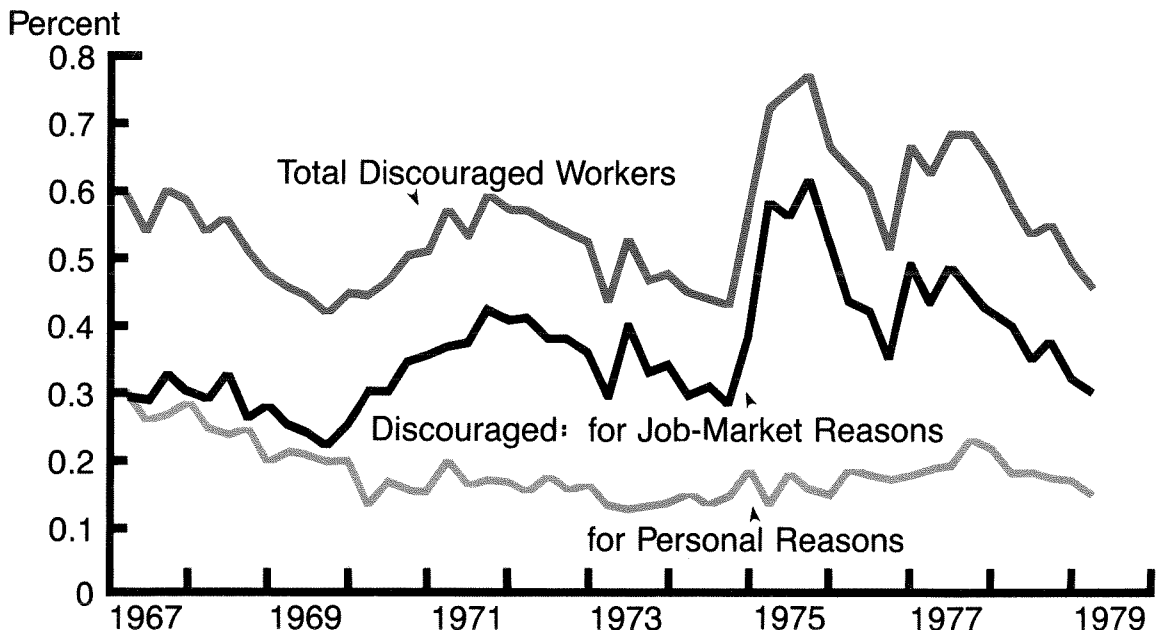
Noninstitutional population, aged 16 and over	161,058
Total labor force	102,537
Civilian labor force	100,420
Employed	94,373
Unemployed	6,047
Not in labor force	58,521
Do not want job now	53,193
Want job now, by reason for not seeking work:	5,328
School attendance	1,374
Ill health, disability	720
Home responsibilities	1,226
Think cannot get job	845
All other reasons	1,163

Source: U.S. Bureau of Labor Statistics, *Employment and Earnings*, January 1979, Tables 1 and 39, annual averages.

all market conditions (Table 2). Between 35 and 40 percent of all discouraged workers are females between the ages of 25 and 59 years. The relative number of older discouraged workers, aged 60 and over, has fallen for both sexes since 1968, while the proportion of younger workers (16 to 24) has increased.

Chart 1

Percentage of Discouraged Workers to Noninstitutional Working-Age Population 1967.1–1979.1



How serious are these workers about wanting a job? If, for instance, an individual has not searched for work in over a year, we could ask whether he/she actually wanted or was available for employment. The Current Population Survey does not regularly collect data which could help answer that question, except for a special list of questions added to the survey in September and October 1978.⁴ This inquiry found that 44 percent of discouraged workers (and 50 percent of those discouraged for job-market reasons) had looked for work during the previous twelve months. For some people, however, the absence of recent search did not mean lack of labor-market commitment. (Some individuals go directly from employment to discouragement, as in the case of

a plant shutdown which provides the major source of employment in a small community.) Adding together those reporting either recent work or search experience in the 1978 survey, 62 percent of the discouraged workers (and 70 percent of those discouraged for job-market reasons) had some form of labor-market commitment—were either employed or officially unemployed—during the prior twelve months. The evidence of labor-market attachment, coupled with the National Commission's evidence that nearly 80 percent of the discouraged contemplate searching for work in the next twelve months,¹ suggests that the duration of discouragement for many of these workers may be relatively short-lived.

Table 2
Discouraged Workers, by Age and Sex

	Thousands of Persons				Percent Distribution			
	1968	1973	1975	1978	1968	1973	1975	1978
All Discouraged								
Workers	667	679	1,082	845	100.0	100.0	100.0	100.0
Males, 16 and over	213	225	359	305	31.9	33.1	33.2	36.1
16-19	42	58		72	6.3	8.5	8.1	8.5
20-24	10	23	57	43	1.5	3.4	5.3	5.1
25-59	53	67	106	110	7.9	9.9	9.8	13.0
60 and over	107	77	109	79	16.0	11.3	10.1	9.3
Females, 16 and over	455	454	722	540	68.2	66.9	66.7	64.0
16-19	67	75	90	60	10.0	11.0	8.3	7.1
20-24	47	75	110	75	7.0	11.0	10.2	8.9
25-59	240	251	433	305	36.0	37.0	40.0	36.1
60 and over	101	54	88	101	15.1	7.9	8.1	11.9

Source: Employment & Earnings, selected issues.

II. Unemployment and Job-Search Models

The conventional framework for analyzing discouraged-worker behavior is an unemployment model,^{1,2} which relates discouragement to the unemployment rate and time-trend variables. The unemployment rate reflects the relative availability of jobs, so that an increase (decrease) in joblessness is expected to increase (decrease) the number of discouraged workers in the population. The time-trend variable represents other economic and social determinants of discouragement about which not enough is known to explain the trends. The unemployment model has been criticized for assuming that labor-supply behavior is unresponsive to wages, and in general for not being based on principles of rational economic behavior.⁹ As an alternative, we turn to a model based upon microeconomic theory, in which expected real wages and job-search costs influence job-market participation decisions.

Job-search models are simplified descriptions of how rational individuals who are seeking to maximize utility go about looking for work and accepting job offers.^{5,6,8} The general framework is applicable to the issue of whether to participate in the labor market, and may be employed to study discouraged-worker or non-participant behavior in general.^{13,14} At the heart of the search model is the notion that job-market decisions must be made in the face of uncertainty, especially uncertainty about the wage that will be offered when a particular employer is contacted. This uncertainty leads the job seeker to devise an "optimal search strategy"—a search procedure designed to ensure that the individual accepts only the job offer which provides the maximum expected return (see Appendix 2 for a presentation of the model).

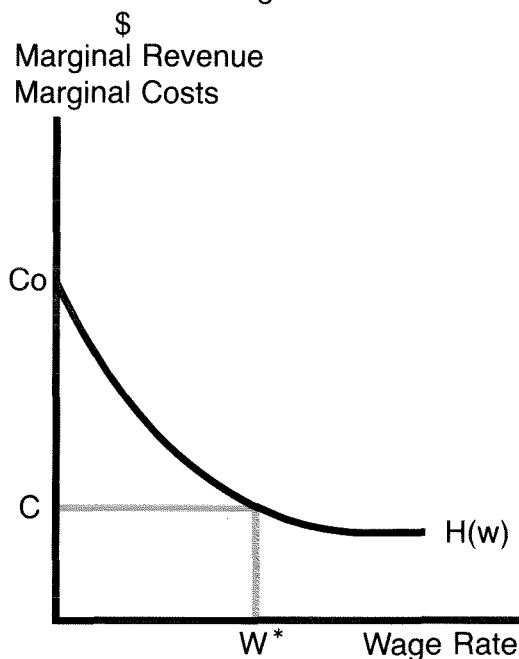
In constructing our job-search model, we begin with an individual who has entered the labor force, knowing that a search for work must be conducted before any offer can be expected. The job seeker presumably has accurate information about the average wage and dispersion of wages in the market for a person with similar qualifications, but is uncertain about the wage that may be offered by

any individual employer. Searching for work is costly. We assume that search costs include such direct expenses as transportation and the mailing of resumes, and that those costs are duplicated for each additional job contact. In this simplified model, wages and costs incurred should be interpreted as discounted present values, and the individual is assumed to be risk neutral.

Since the job seeker has knowledge of the market distribution of wage offers and the corresponding costs of generating those offers, an estimate can be made of the maximum expected return from search—the "reservation wage." The individual's optimal search strategy, then, simply is to accept any wage offer which is equal to or greater than the reservation wage, and to reject all other offers (i.e., continue to search).

The job-search procedure alternatively can be described in terms of an optimal stopping rule. If the job seeker refuses a job offer, he/she will incur additional search costs. At the same time, the individual has an expectation of additional gains from further search; that is, an expectation of being offered a wage greater than the current offer. If the expected wage gain is greater than the marginal cost, the job

Figure 1



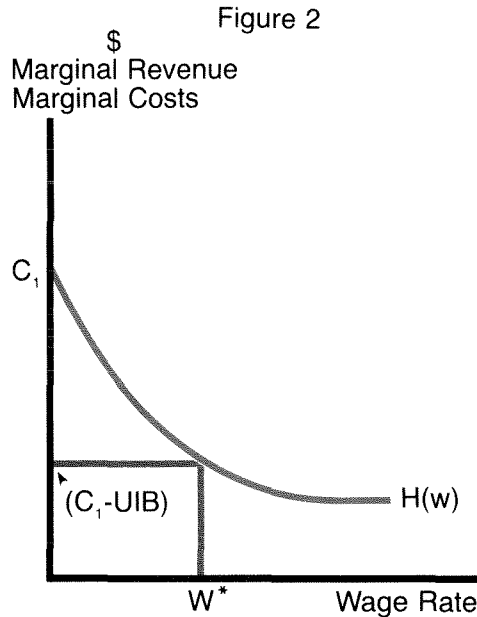
seeker will refuse the current job offer and continue to search. Similarly, if the expected wage gain is just equal to, or less than, the marginal cost, the current wage offer will be accepted and search terminated. In this manner, the optimal time to stop search and accept employment occurs when the expected wage gain is just equal to the marginal cost of continuing to search. At that point, the individual has been offered the maximum expected return—the reservation wage—from the job market (Figure 1).

Each point on the locus, $H(w)$, in Figure 1 gives the expected return an individual can anticipate from further search if the reservation wage corresponding to that point is adopted. At the reservation wage, W^* , the expected marginal return from search is just matched by the marginal search costs. Consequently, no further gains from search are expected, and the wage, W^* , represents the reservation wage the individual adopts in his/her job search.

$H(w)$ slopes downward because the probability of being offered a wage equal to or greater than w declines the higher the current wage offer.⁵ Thus these jobs will be pursued only if the marginal search cost is low.

If search costs are increased sufficiently, the individual would drop out of the labor market, because the marginal costs of finding a job are greater than the expected gains offered in the market. This occurs at a cost equal to or greater than c_0 in Figure 1. Therefore, when relatively high search costs exist, or when they increase, some individuals can be expected to leave the market before finding suitable employment.

Unemployment insurance benefits (UIB) will help to cover the direct costs of search for those individuals eligible to collect such benefits. By lowering the net costs of search, UIB can be expected to keep people in the labor force who might otherwise have dropped out because of high search costs (Figure 2). With search costs relatively high at c_1 , for instance, the individual will find searching for work unprofitable. The payment of unemployment-insurance benefits, however, reduces search



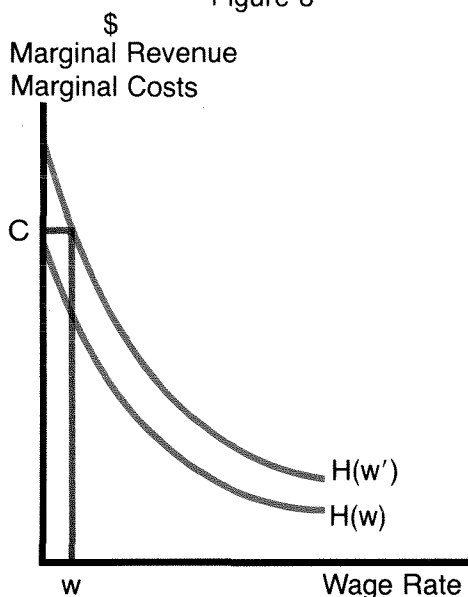
costs, depicted as the difference $(c_1 - UIB)$. At such a level, an individual will search for employment and accept a job offer equal to or greater than W^* .

Finally, an increase in the mean expected real wage (current wages adjusted for expected inflation) would tend to decrease non-participation and vice versa. An increase in the average market wage, with costs constant, shifts the $H(w)$ line upward and to the right as in Figure 3. This shift leads to decreased discouragement, since the wage of W^* now represents a net gain from additional job search.

Several qualifications should be noted, however. First, we have assumed that the individual places no value on his/her non-market time; that is, time spent in leisure, child care, home maintenance, and any other activity outside the labor force. For some individuals, non-market time carries a relatively high value, while for others the reverse is true. A meaningful solution to the labor-market participation decision exists if, and only if, the reservation wage (the maximum expected return from market work) exceeds the value the individual places on his/her non-market time.¹³

According to our search model, labor-force participation is influenced by real wages. However, the model makes no distinction between

Figure 3



permanent and temporary (or transitory) real wages, although recent theory and empirical results suggest that that distinction is important in labor-supply behavior. Milton Friedman has suggested that the supply of labor may respond differently to a wage change expected to be temporary than to one expected to be permanent, i.e., expected to continue.³ According to this view, workers plan their time to take advantage of a temporary opportunity to earn higher-than-normal wages, and take more leisure or non-market time later. Therefore, an expected temporary change in wages is likely to have a greater absolute impact upon labor supply than a wage change regarded as permanent. Empirical results have found the distinction between temporary and permanent wages relevant in the labor-supply behavior of married women.¹¹ Other studies have found temporary wages to be statistically significant in explaining aggregate labor-supply participation and the labor-market decisions of major age-sex groups.^{7,17} Our job-search model may be amended, then, to consider the reactions of individuals to both transitory and permanent components of real market wages.

Another question is whether a job seeker will later drop out and become discouraged if there are no changes in search costs or expected market wages. Previously we assumed

that an individual would have no motivation to drop out of the labor force once he/she made the initial decision to look for work. This was because we placed no limit on the amount of time the individual would search for employment, and assumed that the individual had no prior information to differentiate among prospective employers. If either of these assumptions is relaxed, we find that the individual may indeed drop out, even in the absence of any changes in search costs or expected real wages.

If a person sets a limit on the amount of time to search for a job, then as time goes on, the chances of finding suitable employment decline. As a result, the individual will tend to lower his/her reservation wage. Since search costs are positive, and the reservation wage falls over time, a point can be reached when continued search becomes unprofitable and the person drops out of the market. It may be argued that a person's retirement age sets an effective upper limit on the search horizon, so that senior workers are more likely to drop out of the labor market than younger people.¹³

In addition, an individual may have some information about wages that are likely to be offered by particular employers. For instance, help-wanted ads regularly indicate which firms are most likely to have vacancies. Consequently, even before contacting an employer, a job searcher may possess information which permits him/her to distinguish among firms. Under these circumstances, an optimal search strategy involves sampling specific firms in a systematic fashion, rather than randomly, as assumed above.¹⁵ The individual first searches the firm with the highest expected return, and so on down the list, sampling his/her best opportunities first and poorer ones later. In the search process, the reservation wage declines over time, and with positive search costs, the individual may thus find at some point that additional search is no longer profitable. The person drops out of the market, discouraged with having received no suitable job offer.

Finally, income from other sources—such as the wage income of other family members—is likely to affect an individual's labor-force par-

ticipation decision. All other things being equal, an increase in real wage income of other family members allows that family to have more leisure (non-market time) and more goods. In fact, a change in the average wage paid in the market reflects changes in both the individual's expected wage and the wage of other family members. In the market, then, we might observe two opposing labor flows in response to a change in average real wages. As wages increase, some individuals may leave the labor market due to the higher family income (income effect), and others will enter the market enticed by the higher salaries they can command (substitution effect). Which effect predominates will have to be answered empirically, since economic theory provides no answer to this issue. Also, in light of our previous discussion, these income and substitution effects may differ in magnitude, according to whether the individual regards the change in real wages as transitory or permanent.

The job-search model may be summarized as follows:

$$DW = f(c, uib, w^p, w^t)$$

where DW = proportion of discouraged workers in the population
 c = direct costs of search
 uib = unemployment-insurance benefit payments
 w^p = permanent wages
 w^t = transitory wages

and the signs over the variables indicate the direction of expected impact upon the proportion of discouraged workers in the population. The higher costs of search will lead to higher rates of discouragement, while unemployment benefits act to decrease the net costs of search and the amount of discouragement. Wages, whether permanent or temporary, should work in the same direction although with different strengths. An increase in wage levels should lead to a decline in the discouragement rate as individuals 1) enter the labor market in expectation of higher wages, or 2) decide that they do not want a job because the consequent increase in family income enables them to engage in more non-market activities. In this latter case, a person remains a non-participant, but leaves the ranks of the discouraged for another non-participant group.

III. Empirical Results

We are now ready to apply statistical tests to estimate the influence of the variables suggested by search theory on the number of discouraged workers in the population. Previous studies, as well as our initial work, suggested little connection between changes in economic conditions and the number of workers discouraged for personal reasons.^{1,2} Therefore, we have concentrated on those discouraged for job-market reasons, who have accounted for 70 to 80 percent of the total number of discouraged workers over the past decade.

According to search theory, discouragement is likely to be related to a measure of the direct costs of search, to unemployment-insurance benefit payments, and to real wages. After some experimenting, equation (1) was chosen on the basis of best fit, as measured by the highest correlation among variables. The equa-

tion was estimated not only for the total number discouraged for job-market reasons, but also for age and sex groups within that total. Finally, the equation was estimated for "other non-participants"—the total number of non-participants in the population less all discouraged workers—as a means of comparing the behavior of various classes of non-participants.

$$\left(\frac{DW}{Pop}\right)_t = a_0 + a_1U_{t-1} + a_2UIB_{t-1} + a_3W_t + a_4W_{t-1} \quad (1)$$

The "a's" are constants estimated by ordinary least-square regression techniques. The subscripts refer to the current quarter "t" and the previous quarter "t-1." The data sources are detailed in Appendix 1, and the variables are defined as follows:

DW/Pop = proportion of discouraged workers for job-market reasons in the civilian population, sixteen years and over. Separate regressions were estimated for the total, and for major age and sex classifications, divided by their respective populations.

U = unemployment rate. The unemployment rate of each age-sex category was used in the equation for the corresponding cohort of discouraged worker. In the aggregate equation, for both discouraged workers and other non-participants, the unemployment rate of males aged 25 to 54 was used as an indicator of overall labor-market tightness.

UIB = the ratio of maximum weekly unemployment-insurance benefits to spendable average weekly earnings of a production worker with three dependents. In estimating the net cost of job search, we assume that an individual compares unemployment-insurance benefit payments to net after-tax potential earnings, as measured by UIB.

W = measure of temporary real wages, equal to the difference between current real wages and permanent real wages (see Appendix 1). In line with previous time-series studies, we uncovered no statistically significant association between permanent wages and the incidence of discouragement.^{7,17} Consequently,

we dropped the permanent wage measure and included only the transitory component of real wages as a determinant of labor supply.

The two equations in Table 3 show the results of estimating equation (1) separately for the percentage of females in the working-age population who are discouraged for job-market reasons (DJOBF), and similarly for males (DJOBM). In neither case is the search framework entirely successful in explaining the discouragement rate over the past decade. For males, the unemployment rate—the proxy for overall job availability and direct costs of search—is the only statistically significant determinant of their discouragement rate. (The statistical F test also indicated that as a group the other variables did not add significantly to the determination of the male discouragement rate.) In contrast, the net cost of search—as captured by both the unemployment rate and relative unemployment-insurance benefits—is a statistically significant determinant of female discouragement. Real transitory wages, both current and lagged one quarter, are also statistically significant factors determining female discouragement. According to search theory, the level of real wages should affect the discouragement rate over time, but our estimates instead find that the *change* in transitory real

Table 3
Equations Estimating Percentage of Female and Male Workers Discouraged for Job Market Reasons*
(Sample Period 1969.1–1978.2)

DJOBF =	.286 (1.00)	+	.102 U _{t-1} (6.45)	-	.009 UIB _{t-1} (-2.28)	-	1.02 W _t (-2.17)	+	1.14 W _{t-1} (2.17)
					Mean dependent variable				.50
					R ² , corrected correlation				.66
					Durban-Watson statistic				1.56
DJOBM =	.228 (1.59)	+	.032 U _{t-1} (4.76)	-	.001 UIB _{t-1} (-.799)	-	.026 W _t (-.110)	-	.123 W _{t-1} (-.46)
					Mean dependent variable				.25
					R ² , corrected correlation				.67
					Durban-Watson statistic				1.90

DJOBF = number of female discouraged workers as a percentage of total female population, 16 years and over.

DJOBM = number of male discouraged workers as a percentage of total male population, 16 and over.

U = unemployment rate of the respective cohort

UIB = maximum unemployment-insurance benefit payments as a percentage of spendable average-weekly earnings of a production worker with three dependents.

W = Current real hourly compensation less permanent real hourly wages.

*t-statistics = statistics in parentheses.

wages over a six-month period—rather than the *level*—is the significant determinant among females. The estimated coefficients associated with the real wage terms are of opposite signs and are not much different from each other, and their sum is not different from zero. This means that any given level of real transitory wages that has persisted for at least two quarters will have no net impact, and only a change in real transitory wages remains as a determinant of the female discouragement rate.

The results suggest that the availability of work may be the sole factor influencing male discouragement with job-market conditions. Additional factors, however, are important in the participation decision of the much larger group of females, who comprise two-thirds of discouraged workers. In particular, both the liberality of unemployment-insurance benefits and the change in real transitory wages have

been found to have significant effects on female discouragement decisions.

As the earlier discussion suggests, discouraged males have not been as responsive as females over the past decade to changes in labor-market conditions. Males, on average, place a relatively low value on their non-market time since, as a group, they constitute the primary source of family income. Consequently, they are more likely than females to be labor-market participants, and are less likely to leave the job market after encountering changes in real wages or net search costs. For instance, a one-percentage-point change in their own unemployment rate led to an average change of only .032 percentage points in the male discouragement rate, and to more than three times that amount (.102) in the female discouragement rate (Table 3). Other factors than relatively high non-market value

Table 4
Discouragement Rates¹ of Female and Male Discouraged Workers
for Job Market Reasons, by Age‡
(Sample Period 1969.1–1978.2)

	Constant	U(t-1)	UIB(t-1)	W(t)	W(t-1)	T	TSQ	Mean Discouragement Rate	R ²	DW
Females										
16-19	.532 (.614)	.080 (2.87)	-.018 (-1.65)	*	*			.64	.21	1.89
20-24	.938 (1.11)	.090 (2.58)	-.017 (-1.49)	-3.16 (-2.27)	2.95 (1.89)			.68	.23	2.50
25-59	.400 (1.21)	.134 (6.80)	-.009 (2.06)	-.997 (-1.78)	1.03 (1.65)			.55	.69	1.99
60 and over	.53 (4.13)	.035 (2.37)	*	*	*	-.025 (-3.3)	.0003 (3.27)	.21	.29	1.09
Males										
16-19	.586 (1.04)	.029 (2.14)	*	*	*			.56	.27	2.06
20-24	.428 (1.10)	.037 (4.05)	*	*	*			.36	.52	1.88
25-29	.058 (.540)	.022 (3.54)	*	*	*			.15	.52	2.10
60 and over	.41 (1.12)	.049 (1.78)	*	*	*			.29	.29	2.34

1 Discouragement rate is the number of discouraged workers in a cohort as a percentage of their respective population.
* Not significant at 10-percent level of significance. See Table 3 for explanation of variables. T is time (1969.1 = 1), and TSQ is time squared.
‡ t-statistics in parentheses.

may be reflected in the greater sensitivity of females to changes in unemployment conditions. For instance, job discrimination against females will mean a higher average search cost for them when overall labor market conditions change. However, our tests cannot separate out these elements, which are not necessarily mutually exclusive.

The general pattern observed for the aggregate male and female groups is also evident when the groups are broken down by age (Table 4). In particular, unemployment-insurance benefits and the change in transitory wages are statistically significant only among the various female groups. For females 60 and over, trend coefficients indicate that the percentage of discouraged workers has been declining over time, which is not true for any other age-sex group. Our results also suggest that the chances of discouragement decline with age, which is contrary to the implication of our earlier argument that years to retirement may set a significant limit on the work and search horizons of individuals. This may be because younger workers expect to work a relatively short time in a particular job, which may limit the amount of time the individual can profitably spend on search.

The various age groups also respond differently to changes in unemployment, with young workers generally, being less sensitive than others to changes in unemployment rates. For instance, a one-percentage-point change in their own unemployment rate changes the discouragement rate of females aged 25 to 59 by 24.4 percent (Table 5), compared with changes of 12.5 percent and 13.2 percent for females aged 16 to 19 and 20 to 24, respectively. To summarize, younger workers generally are more likely to become discouraged about job prospects than their older cohorts, but younger workers are relatively less sensitive to changes in the availability of jobs and therefore less likely to move out of discouragement when job opportunities improve.

Discouragement at full employment

According to a popular view, discouragement depends solely, or to a great extent, on lack of jobs available, so that the number of

discouraged workers would greatly diminish under conditions of nationwide full employment. However, our statistical tests indicate otherwise. We reestimated equation (1) for each age-sex group, substituting a measure of nationwide labor-market tightness for the cohort's own unemployment rate. However, we used the prime-age male (25 to 54 years) unemployment rate for this purpose instead of the overall unemployment rate, because the latter's value as an indicator over the past two decades has become marred by various demographic and institutional changes in labor markets.

We derived estimates of the number of discouraged workers that could be expected under full-employment conditions by assuming full-employment values for each of the right-hand-side variables in equation (1)—specifically, by assuming a prime-age male unemployment rate of 3.1 percent, a value of 73 percent (the 1979 estimate) for the relative rate of unemployment-insurance benefits, and no change in transitory real wages. Under full-employment conditions, we estimate that 523,000 individuals would be discouraged for job-market reasons, or .32 percent of the Sep-

Table 5
Responsiveness to a One Percentage-Point Change in Own Unemployment Rates among Age-Sex Cohorts (1969–78 average)

	Percentage Change in Discouragement Rates ¹
Females	
16-19	12.5
20-24	13.2
25-59	24.4
60 and over	16.6
Males	
16-19	5.2
20-24	10.2
25-59	14.7
60 and over	16.9

¹ Values are calculated at the mean discouragement rate of each cohort. For instance, for female teenagers, $(.080/.64) \times 100 = 12.5$ percent. Values are derived from coefficients of the unemployment rates and the mean discouragement rates for each cohort (Table 4).

tember 1979 population (Table 6). Just over half the discouraged at full employment would be prime-age workers (40 percent female and 12 percent male). Teenages and young adults (20 to 24) share about equally in the next largest group, comprising 35 percent of total discouraged, and senior workers make up the remaining 12 percent.

It is perplexing that so many workers would remain discouraged under conditions of nationwide labor-market tightness. Over the entire period 1967I–1978II, the discouragement rate for job-market reasons has averaged .37 percentage points. At full employment, then, the discouragement rate of .32 percent is 85 percent of its mean level, and 60 percent of the peak discouragement rate reached during the 1975 recession.

Search theory suggests several reasons for this paradox. First, an individual's work horizon sets a limit on the time he/she can profitably look for work, as long as the cost of search is positive. Consequently, those with shorter work and search horizons are more likely than others to leave the labor market. Discouraged workers, as a group, may have relatively short work horizons. Again, we may expect discouragement to persist, on average, if the job market is characterized by a dispersion of wages paid for similar skills, and individuals search systematically rather than sequentially for work, and so choose the "best" possibilities first. As an individual continues searching, his/her reservation wage declines. At some point it may pay the individual to leave the market for a while and wait for normal turnover to open up higher-paying jobs, rather than accept a relatively low-paying job. Similar behavior appears to be optimal under conditions in which the highest expected pay is associated with the minimum wage.¹⁰ In that case, individuals find it profitable to queue for jobs in the covered sector rather than accept lower wages in the noncovered sector. The same type of behavior may be seen in the case of discouraged workers when they state that they plan to enter or re-enter the job market within the coming year—which suggests a tendency simply to wait for the better-paying jobs to become available.

Table 6
Estimated Discouraged Workers for Job Market Reasons Under Conditions of Full Employment*

	Thousands of Persons	Percent Distribution
Total	523	100.0
Females, 16 and over	345	66.0
16-19	49	9.4
20-24	58	11.1
25-59	212	40.5
60 and over	26	5.0
Males, 16 and over	178	34.0
16-19	44	8.4
20-24	33	6.3
25-59	64	12.2
60 and over	37	7.1
Discouragement rate, total	.32	
Average discouragement rate (1967.1–1978.2)	.37	

* Numbers of discouraged workers derived from September 1979 population estimates, with assumptions of 3.1-percent unemployment rate (male, 25-54 years) and 73-percent relative value of unemployment benefits (early 1979 value). Based on estimates from 1969.1–1978.2 sample period.

Discouraged vs. other non-participants

In its study, the National Commission asked, "Is the criterion of availability a useful one for distinguishing between a ready labor-force reserve and other non-participants?" The alleged availability of discouraged workers is at the heart of the argument that they represent unutilized and ready resources which should be considered as part of the official labor force. Yet special surveys have found that sizable numbers of individuals who had stated that they did not want a job (were unavailable although wanting to work) were in fact in the labor force one or two years later—sometimes in greater numbers than those who had said earlier that they were available for work.¹

To shed some light on this question, we have estimated the job-search model equation (1) not only for discouraged workers for job-market reasons but also for "other non-participants," defined as total non-participants less workers discouraged for both personal and

job-market reasons (Table 7). These estimates are designed to compare the responsiveness of the labor-market participation rates of both groups to changes in unemployment and other labor-market indicators. Both the one-quarter lagged and long-run responses are given for other non-participants, because our statistical estimates indicate that non-participants respond slowly over time to changes in economic variables, so that their initial response is smaller than the ultimate one. In contrast, no lagged response can be identified in the discouraged-worker group.

Our results indicate that individuals discouraged for job market reasons are more responsive than other non-participants to changes in labor-market conditions. For instance, an increase in the availability of jobs, as measured by a one-percentage-point decline in the prime-age male unemployment rate, on average, led to a 20.8-percent decline in the discouragement rate but only to a 0.7-percent long-run decline in the other non-participation rate. The estimates generally suggest that discouraged workers, as a group, show a greater willingness and availability to seek employment than the other non-participation group.

Another distinction between the two groups stems from their reaction to an acceleration or

deceleration in transitory real wages. An increase in these wages is associated with a decline in the discouragement rate, and with an increase in non-participation. Some families apparently regard an improvement in real wages, and resultant rise in income, as a means of supporting more non-market time. Subsequently, some family members leave the labor force, causing an increase in the aggregate other non-participation rate. However, the same wage circumstances lead to a decline in the proportion of discouraged in the population, as these individuals, motivated by improving real wages, seek employment or leave the discouraged-worker category for other non-participation.

Because discouraged workers represent a relatively small percentage of the population, they generally fail to influence cyclical movements in the labor force. When the unemployment rate of prime-age males increases by one percentage point, the initial reaction is an almost equal increase in both the number of discouraged and other non-participants, but ultimately, the movement in the labor force is dominated by an increase in other non-participants rather than discouraged workers (Table 7, top line). However, unemployment benefit payments and changes in transitory real wages

Table 7
Response of Discouraged Workers for Job Market Reasons,
and Response of Other Nonparticipants, to Various Economic Changes*

	Change (Percent)			Change (Numbers)		
	DWR‡	Other Nonparticipants		DWR‡	Other Nonparticipants	
		First Quarter	Long-Run		First Quarter	Long-Run
Increase of 1 percentage point in prime-age male unemployment rate	20.8	0.37	0.7	122,770	157,530	425,720
Increase of 1 percentage point in relative unemployment-insurance benefits*	-0.8	-0.2	-0.5	-4,780	-122,770	-331,810
Increase of .01 percentage points in the change in real wages	-1.35	0.08	0.21	-7,970	45,920	124,110

* Changes are stated in terms of an increase in each economic variable; for a decrease, the signs are reversed. The equations were estimated over the period 1967.1-1978.2. Percent changes are evaluated at the mean rates of .37 percent for discouraged workers for job-market reasons, and 37.46 percent for all other non-participants. Numbers are estimated relative to the September 1979 working-age population of 159.4 million.

‡ Discouraged workers for job-market reasons, as a percent of the civilian noninstitutional population.

also affect participation behavior, and at times can reverse the response to changes in unemployment.

The general pattern can be discerned in both of the business cycles that have occurred since discouraged-worker data first became available (Table 8). During the two recovery periods, the decline in other non-participation was responsible for between 80 and 94 percent of the cyclical increase in the labor-force participation rate—and the same was true, only in the opposite direction, during the 1970–71 downturn. However, during the more recent decline, close to 70 percent of the drop in labor-force participation was associated with an increase in discouragement about job-market prospects. This reversal can be traced largely to the fact that relative unemployment-insurance benefits play a somewhat larger role in the labor-market participation decisions of other non-participants than they do for discouraged workers. During the 1974–75 recession,

these benefit payments increased substantially, and tended to keep many individuals in the labor force who would otherwise have left and been included among other non-participants. The Current Population Survey purportedly is designed to distinguish between those individuals who want work (and are available for work) and all other non-participants. The question is whether the availability criterion in fact captures the cyclical component of the labor force—the so-called labor-force reserve. We found that between 80 and 95 percent of the cyclical movement in the labor force is generally due to individuals entering and leaving the non-participation category, and not to discouraged workers. Consequently, we conclude that the availability criterion is not sufficient to capture those workers or groups of workers who actually comprise the major source of the labor-force reserve.

Table 8
Cyclical Responses of Discouraged Workers and Other Nonparticipants

	Cyclical Change in the Labor Force			
	<u>Decline</u> <u>1970.1–71.2</u>	<u>Recovery</u> <u>1971.2–73.4</u>	<u>Decline</u> <u>1974.1–75.4</u>	<u>Recovery</u> <u>1975.4–76.1</u>
Nonparticipation rate (total)	.74	-.79	.29	-.15
Nonparticipation rate excluding discouraged workers	.65	-.74	.08	-.12
Percent of total rate	(88.0)	(94.0)	(28.0)	(80.0)
Discouraged worker rate	.09	-.05	.21	-.03
Percent of total rate	(12.0)	(6.0)	(72.0)	(20.0)

IV. Summary and Conclusions

With the help of job-search theory, this paper has analyzed the behavior of workers who give job-market reasons for their discouragement—a group which accounts for 70 to 80 percent of the total number of discouraged workers. Our approach suggests that unemployment-insurance benefit payments (by reducing the cost of looking for work) and expected real wages will influence an individual's labor-force participation decisions—as well as his/her chances of finding a job. The results may be summarized as follows.

(1) Although those discouraged for job-market reasons appear more responsive than other non-participants to changes in labor-market conditions, the discouraged generally represent only a small proportion of the total cyclical movement in the labor force. Consequently, the availability criterion of the Current Population Survey apparently does not succeed in separating the labor-force reserve from other groups of non-participants.

(2) Under conditions of nationwide full employment, we should observe a relatively small percentage of discouraged workers. At least according to the popular impression, discouraged workers are readily available for work, and therefore their numbers should greatly diminish, if not disappear, under general conditions of high employment. In fact, this is the expected behavior of a labor-force reserve. However, we find that at full employment, the discouragement rate for job market reasons actually tends to remain at about 85 percent of its average level, and at about 60 percent of its peak (1975) rate. Our job-search approach suggests several reasons for this highly perplexing result. Workers with relatively short work horizons generally find it profitable to limit the amount of job search, which is a costly undertaking. If not finding work within that relatively short time period, they may drop out of the labor force. Many discouraged workers thus would expect to hold jobs, once found, for relatively short durations. Or workers may search the best-paying jobs first, and

not finding employment, would choose to wait for normal job turnover—because that is the most profitable choice for them to make—rather than accept lower-paying jobs.

(3) The job-search approach was not entirely successful in explaining discouragement behavior over the past decade. That approach suggests that the individual job seeker responds to the expected market return, as estimated by the direct costs of search (proxied by the unemployment rate), the reduction in such costs (measured by unemployment-insurance benefits), and the expected real wage rate. However, we found that males, who account for one-third of the discouraged for job-market reasons, were sensitive only to changes in their unemployment rates. Females, who account for the majority of discouraged workers, in contrast were also responsive to changes in relative unemployment-insurance benefits and to changes in real wages that were believed to be above or below average (that is, a transitory real wage). Search theory suggests that it is the *level* of real wages (transitory or permanent), and not the change, which is pertinent in job-market decisions. Our results suggest, however, that factors other than the availability of jobs (the conventional determinant of discouragement) enter into the determination of discouraged workers' labor-supply decisions. Discouragement is not solely a consequence of the availability of jobs, but also of unemployment-insurance benefit payments and expected short-run changes in real wage payments.

Should discouraged workers be included in the labor force and therefore in the official measure of unemployment? Since they represent only a small percentage of the cyclical movement in the labor force, their inclusion will do very little towards correcting any distortions in official labor-force measures. Moreover, most of these individuals appear unresponsive to changes in labor-market conditions. Large numbers of discouraged workers remain so even during periods of tight labor markets,

when substantial shortages of workers exist amid building inflationary pressures. This suggests that most discouraged do not fit the criterion of a ready labor-force reserve—individ-

uals willing and available for work according to the state of the economy—and therefore should not be included in official labor-force statistics.

Appendix 1 Data Sources

The Bureau of Labor Statistics is the basic source for U.S. employment and unemployment data. Discouraged-worker data, for example, are found in the BLS publication, *Employment and Earnings*.

UIB: Maximum weekly benefits payable under the unemployment-insurance system were deflated by the consumer price index and divided by average spendable weekly earnings of production worker with three dependents. The maximum weekly benefits series was taken from the Board of Governors MPS model database, and the consumer price index and average spendable weekly earnings series were taken from the FRB San Francisco Database.

U: The unemployment rate of each age-sex category was taken from the FRB San Francisco database.

W: Employee compensation rate in nonfarm private domestic business, deflated by the GNP implicit deflator, less permanent real wages. This is estimated as follows: for permanent wages, we assume that real wages are equal to a percentage of labor productivity. That per-

centage is equal to labor's share in total income produced (gross business domestic product)—a share which has trended slowly over time. The share of labor can be written as an identity:

$k = \text{total labor income/gross business domestic product}$, where total labor income is equal to wages times the number of workers, $W \times N$, and gross business domestic product is equal to the general price level times the amount of real output produced, $P \times Q$. We may rewrite the above as,

$$k = (W \times N)/(P \times Q), \text{ or rearranging} \\ (W/P) = k \times (Q/N),$$

which states that real wages are a percentage of labor productivity. We estimated permanent real wages by first estimating the trend share of labor k_t , then the trend rate of output per worker $(Q/N)_t$,

$$\text{estimate of } (W/P) = k_t \times (Q/N)_t.$$

The wage series was taken from the MPS model database of the Board of Governors.

Appendix 2 Job-Search Model of Labor-Force Discouragement

Following the discussion in the text, the dispersion of offers considered by the job searcher is incorporated into the model by assuming that there is a cumulative probability distribution, F , of wages which govern the offers tendered. We assume that the distribution of wages is invariant over time in this simplest case (so that business-cycle effects are ignored), and that wage offers are independent random occurrences from that distribution, F . In any given search period, the probability that the individual will receive an offer of w or less is $F(w)$, and this probability, given our as-

sumptions, does not depend on any past offers at the time the offer is made. We further assume that the individual seeks to maximize his/her expected net benefits, which are equal to expected wages less expected costs of search.

In the following the symbols are defined as
 $c = \text{cost per period of search}$

$w = \text{random variable denoting a wage offer}$

$F(w) = \text{cumulative probability distribution of } w; f(w) \text{ is the probability density function.}$

$y(w) = \text{return from a job offer, } w.$

If a wage offer is accepted after the n th offer, then the return is the value of the n th offer, w_n , less the cost of search, which we assume is a constant each period, times the number of job offers.

$$y = w_n - cN$$

Let w^* signify a minimum acceptable wage; the individual will accept an offer if it is equal to or greater than w^* . The individual's task is to choose w^* which maximizes his/her expected return. Symbolically the expected return from search is

$$E(Y) = E(w/w \geq w^*) - cE(N) \quad (2)$$

The maximum, w^* , is derived by maximizing $E(Y)$, with respect to w^* . To derive w^* , first note that $E(w/w \geq w^*)$ is the mean conditional wage, it is the expected wage conditioned on that wage being equal to or greater than w^* .

$$E(w/w \geq w^*) = \frac{\int_{w^*}^{\infty} wf(w) dw}{\int_{w^*}^{\infty} f(w) dw} = h \quad (3)$$

Secondly, note that the expected value of N , $E(N)$, is the expected period of search until a wage offer is equal to or greater than w^* . It has a geometric distribution,

$$P(N=k) = p(1-p)^{k-1}$$

where the parameter p is the probability of "success",

$$p = \int_{w^*}^{\infty} f(w) dw \\ = 1 - F(w^*),$$

$$\text{and the mean duration of search is } \frac{1}{p}. \quad (4)$$

We may rewrite (2) as

$$E(Y) = \frac{\int_{w^*}^{\infty} wf(w) dw}{\int_{w^*}^{\infty} f(w) dw} - cE(N) \quad (5) \\ = h - cE(N)$$

The first-order conditions for deriving the maximum expected gain, $\max E(Y)$, is given by

$$\frac{dE(Y)}{dw^*} = \frac{d}{dw^*} (h - cE(N)) = 0 \\ = \int_{w^*}^{\infty} wf(w)dw - w^* \int_{w^*}^{\infty} f(w) dw - c = 0 \\ \text{or, } c = \int_{w^*}^{\infty} (w - w^*) f(w) dw = H(w^*) \quad (6)$$

The value w^* is the wage offer which satisfies the equality in (6). The equality (6) has a familiar economic interpretation. The cost, c , is the marginal cost of generating another job offer, which is equal to the expected marginal return from searching another period, $H(w^*)$ ¹. The critical value w^* is also known as the reservation wage, or the minimum wage an individual will accept.

¹ Note that $H(w^*)$ is a strictly decreasing function of w^* , with slope equal to $-(1 - F(w^*)) = -p$, and with

$$\frac{d^2H(w^*)}{(dw^*)^2} > 0.$$

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