

INFLATION EFFECTS ON THE LABOR MARKET: A TRANSITION RATE MODEL

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摘 要

本文在兩狀態（就業和失業）搜尋模型下，以估計保留工資的方法，應用美國NLSY 1980至1983年的個體資料，探討物價膨脹對就業和失業間之轉換率的影響。其中保留工資係以黑克門(Heckman)二階段估計法，修正工資訊息而得；估算轉換率的參數則以結構性轉換率模型，運用最大似法取得。本文發現，未預期到的物價膨脹對轉換率的影響並不顯著，此隱含：政府採行不被勞動力預期的物價膨脹政策不會降低其失業率。

ABSTRACT

The impact of inflation, particularly unexpected inflation, on the operation of the labor market remains an important and empirically unresolved issue. Earlier work, largely based on time series analysis of industry aggregate quit data, found little impact of inflation on that critical labor market mechanism. This earlier work has been criticized for not adequately distinguishing between expected and unexpected inflation. At the same time, longitudinal micro data sets of high quality have become available, permitting the estimation of more complete transition models, that incorporate job acceptance by workers who are not employed as well as job termination by employed workers. This paper analyzes empirically the impact of unexpected and expected inflation on these labor market transitions.

In a two-state (employment, unemployment) search model, the reservation approach is utilized in analyzing the male sub-sample of the 1979 Youth Cohort of the National Longitudinal Surveys (NLSY) over the period 1980 to 1983. The wage information is corrected for selectivity bias by a two-stage estimation method, and reservation wages are then derived. A maximum-likelihood technique is used with the structural transition model to estimate the parameters of the true wage offer distribution. Implied transition rates are then calculated. The impact of unexpected inflation on transition rates appears through its influence on the real reservation wage.

Confirming the results of earlier works, the empirical results indicate that the impact of "unexpected" inflation on transition rates is insignificant because the impact of unexpected inflation on the intervening reservation wage is not significant. Hence, trying to "fool" youths by unexpected inflationary policies in order to reduce their unemployment rate is unlikely to be successful.

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I. INTRODUCTION

The impact of inflation, particularly unexpected inflation, on the operation of the labor market remains an important and empirically unresolved issue. Earlier work (e.g., Parsons [1973]), largely based on time series analysis of industry aggregate quit data, found little impact of inflation on that critical labor market mechanism. The work has been criticized for not adequately distinguishing between expected and unexpected inflation. At the same time, longitudinal micro data sets of high quality have become available, permitting the estimation of more complete transition models, ones that incorporate job acceptance by workers who are not employed as well as job termination by employed workers. This paper proposes to analyze empirically the impact of unexpected and expected inflation on these labor market transitions.

A two state model is considered—employment and unemployment. The economic environment and the worker decision structure within the environment can be outlined briefly. Employed persons are assumed to work under long-term, real wage contracts. The employer adjusts wages according to a proxy for actual inflation. An employed worker speculates correctly that there is an exogenous positive probability of job loss. If the current job is terminated, an employed-person becomes unemployed and immediately faces a positive probability of receiving a new wage offer. Unemployed workers evaluate the wage offer according to the expected rather than the actual rate of inflation, since they do not know the latter at the time that they must commit to a search strategy. Neither are they sure that the firm is reliable. Workers' inflationary expectations are assumed to be rational but have some lags in information collection. If an unemployed worker believes that the real value of the current offer is above his reservation wage, then he will accept the job offer and become employed.

The data set employed in this analysis is the male sub-sample of the 1979 Youth Cohort of the National Longitudinal Surveys (NLSY) over the period 1980 to 1983. The NLSY was first conducted in 1979, sampling 12,686 young persons whose ages as of January 1, 1979 ranged from 14 to 21. In this data set, it is possible to construct a continuous work history for each respondent. The wage information, available only for intervals of employment, is corrected for selectivity bias by a two-stage estimation method. No selectivity bias is found. Since a series of reservation wages is essential to a structural-form transition model, reservation wages are next derived following the two-stage estimation method. A maximum-likelihood technique is then used in a structural transition model to estimate the

parameters of the true wage offer distribution. Implied transition rates are calculated when all parameters are available. The impact of unexpected inflation on transition rates appears through its influence on the real reservation wage.

Consistent with earlier work, the empirical results indicate that the impact of “unexpected” inflation on transition rates is not significant because the impact of unexpected inflation on the reservation wage is not significant. Hence trying to “fool” youths by inflationary policies to reduce their unemployment rate will not work. The conventional Phillips curve relationship does not apply.

The remainder of this paper is organized as follows: Section II presents the two-state model. The relevant data is described in section III. A discrete-time structural-form estimation is specified and estimated in section IV. Conclusion and possible future extensions of the existing models are described in section V.

II. THE MODEL

Consider a two-state search model which distinguishes only between individuals who are employed and those who are not. Employed persons are assumed to work under long-term, real wage contracts. The employer adjusts wages according to a proxy for actual inflation, for example, the quarterly Consumer Price Index (CPI) growth. Unemployed workers evaluate the wage offer according to the expected rather than the actual rate of inflation, since they do not know the latter at the time that they must commit to a search strategy. Neither are they sure that the firm is reliable. Workers’ inflationary expectations are assumed to be rational but have some lags in information collection, using perhaps the expectation of quarterly CPI growth. Hence, the inflationary surprise is the difference between the quarterly CPI growth and the corresponding expectation of quarterly CPI growth. In this set-up, the expected inflation will, in general, not match actual inflation.

The model ignores the distinction between unemployment and being out of the labor force. All of those who are not currently employed are treated as if they are searching for a position. Gonul [1985] provides evidence that supports the equivalence of the two nonemployed states for the sample to be employed below (males in the National Longitudinal Surveys of Youth Labor Market Experience (NLSY)). The NLSY provides aggregate duration information for unemployment and being out of the labor force rather than specific sequence spells. Using a waiting time model based upon an exponential distribution with three-states (unemployed, out of the labor force, and employed), and a maximum likelihood approach, Gonul

finds that the data on young males supports the equivalence of unemployment and being out of the labor force in this transition rate framework.

Unemployed workers have a probability α of receiving a job offer. Employed workers do not receive a wage offer, because they are assumed to be not searching. The unemployed do not get this benefit without a cost, however. It is assumed that there is an additive psychic cost of job search, c , that is independent of inflationary processes, etc. An employed worker speculates correctly that there is an exogenous positive probability of job loss, δ . Once the current job is terminated, an employed person becomes unemployed and immediately faces a positive probability, α of receiving a new wage offer without incurring any job search costs, an advantage to a job-just-terminated person. The probability α of obtaining an offer is assumed to be constant and independent of the duration of unemployment and of the inflation rate.

In each period, individuals choose between their current state and any new wage offer they may receive, in order to maximize their expected present value of future net income. Facing an unknown true *real* wage offer distribution, F , with unknown mean, μ , and unknown standard error, s , people imagine that the true mean, μ , in terms of real value, has not changed and that there exists a real reservation wage, w_n , which is only affected by inflationary surprises. Because nominal reservation wages account for expected inflation, only unexpected inflation may change the level of the real reservation wage. If inflation is underestimated, the level of the real reservation wage is lower; if inflation is overestimated, the level of the real reservation wage is higher. Any wage offer larger than w_n is accepted by an unemployed searcher. The searcher perceives accurately that in any subsequent period there is a positive probability, δ , of losing the job that he accepts in the current period. The transition rate is defined as the probability of moving from state i to state j (i, j =unemployment or employment). The structure of the transition rate consists of the probability of wage offer arrivals, the probability of job termination, and transition probabilities. The transition probability from state i to state j , depending upon the wage offer distribution $F(\mu, s)$, refers to the probability that an obtained wage offer will lead a person in state i to choose state j . In other words, the transition probability from unemployment to employment refers to the probability that an arrived wage offer is acceptable to an unemployed person. The transition probability from employment to unemployment refers to the probability that an arrived wage offer is unacceptable to a job-just-terminated person. Inflationary expectations are assumed to be rational. In terms of real values, the real wage offers and the true real wage offer distribution F are invariant to inflation, but

the real reservation wage may change due to inflationary misperceptions. Varying reservation wages due to misperception of other characteristics or durations are not considered in the model. The impact of unexpected inflation on transition rates occurs through its influence on the estimated reservation wages. Once the value of w_n is obtained, the mean and the standard error of F and the other parameters (α and δ) can be estimated using MLE. The numerical transition rates can then be calculated.

Most previous work on transitions ignores the role of unexpected price changes. In this paper, the influence of unexpected and expected price inflation are measured in the estimation of the real reservation wage in the steady state. One major hypothesis to be tested from the two-state model is that an unexpected price hike significantly decreases the level of the real reservation wage. Then, with the probability of wage offer arrivals remaining constant, the transition probability from unemployment to employment increases and the transition probability from employment to unemployment decreases. Note that this model implies neutrality. Thus expected inflation will increase the nominal reservation wage proportionally.

It is possible to identify the parameters of the transition matrix in this two-state model. A two-stage estimation method is used to obtain the series of reservation wages and determine the influence of unexpected inflation, as the error terms are assumed to result from specification errors on the observed wage and the reservation wage equations respectively. A maximum likelihood estimation method is utilized to derive the parameters on transitions.

2.1 A Two-state Model: Unemployed-Searching Only

Referring to the assumptions described earlier, a two-state discrete-time search model is constructed and a reservation wage approach is utilized. Facing an uncertain future with no capital constraint, a risk-neutral unemployed-searcher will maximize the expected present value of future net income, U_n , at the beginning of every time interval (one week),

$$(2.1) \quad U_n = -C_n + \alpha [1/(1+r)] E \max \{U_c(w), U_n\} + (1-\alpha) [1/(1+r)] U_n$$

where U_n = the net income value of unemployment

c_n = constant search cost for unemployed searchers

α = probability of receiving a wage offer for an unemployed person

$[1/(1+r)]$ = a simple/discrete discounting factor

w = wage

$U_c(w)$ = the net income value of employment with wage w .

The term $[E \max \{U_c(w), U_n\}]$ reflects the expected value of the better of the two alternatives that confront the person. It is discounted by multiplying $[1/(1+r)]$ to yield an equivalent present value. This value is realized if a wage offer arrives (with probability α). The third term is the discounted value when no wage offers arrive. The first term of (2.1) is not discounted because the search cost, c_n , occurs in the current period.

Similarly, an employed person will maximize the expected present value of future net income, U_c , given the probability that the current job will be terminated and the probability that a new wage offer will arrive without psychic search cost, c_n , after job termination.

$$(2.2) \quad U_c(w) = w_a + [1/(1+r)] [\delta(1-\alpha)U_n + \delta \alpha E \max \{U_c(w_b), U_n\} \\ + (1-\delta) E \max \{U_c(w_a), U_n\}]$$

Where r = interest rate

δ = an exogenous probability of job loss

α = probability of an arrived wage offer for a job terminated person

w_a = current wage offer

w_b = another wage offer

$U_c(w_i)$ = the net income value of employment with wage w_i , $i = a, b$

There is no cost of search assigned to employed persons because they are assumed to be not searching. However, if a termination, which may be generated by either employers or employees, occurs, the worker will immediately face the probability α of receiving a wage offer without costs. If the newly arrived offer is acceptable, he will be observed as transferring from one job to another. Otherwise, he will be observed as moving from employment to unemployment.

Assuming that $E(w^2) < \infty$, the above dynamic setting possesses a static correspondence, namely, the reservation wage property. Let w_n represent the reservation wage. Then, $U_c(w_n)$ will equal U_n , and $w_n = rU_n$. An unemployed searcher will accept an offer if $w \geq w_n$. Reservation wages, although not directly observed, may be estimated as long as the reservation wage equation can be identified.

2.2 Transition Rates in a Two-State Model

The transition rate is the probability of moving from state i to state j . The structure of the transition rate consists of the probability of wage offer arrivals, the probability of job termination, and transition probabilities. The transition probability from state i to state j , depending upon the wage offer distribution, $F(\mu, s)$, refers to the probability that an obtained wage offer will lead a person in state i to choose state j . In other words, the transition probability from unemployment to employment refers to the probability that an arrived wage offer is acceptable to an unemployed person. The transition probability from employment to unemployment refers to the probability that an arrived wage offer is unacceptable to a person who has just lost his job.

Defining $\lambda_{i,j}$ to be the transition of choosing state j while currently in state i , (i, j = unemployment n or employment e), $\lambda_{i,j}$ can be written as:

$$(2.3) \quad \lambda_{ne} = \alpha [1 - F(w_n)];$$

$$(2.4) \quad \lambda_{nn} = \alpha F(w_n) + (1 - \alpha);$$

$$(2.5) \quad \lambda_{en} = \delta \alpha F(w_n) + \delta(1 - \alpha);$$

$$(2.6) \quad \lambda_{ee} = (1 - \delta) + \delta \alpha [1 - F(w_n)];$$

$$\lambda_{ne} + \lambda_{nn} = 1 \quad \text{and} \quad \lambda_{en} + \lambda_{ee} = 1;$$

where F is the true real wage offer distribution function and w represents the current real wage. The transition from unemployment to employment, λ_{ne} , depends upon the probability of obtaining an offer and the probability that the offer is larger than the reservation wage. The transition of remaining in unemployment, λ_{nn} , consists of two terms: the probability of encountering a bad offer ($w < w_n$); and the possibility of receiving no offers at all. The transition from employment to unemployment, λ_{en} , occurs in two situations: first, when the current job is terminated and only a bad offer is available; and secondly, when the job is terminated and there are no offers. Finally, the transition of remaining employed, λ_{ee} , has two components. In one case, the worker keeps the current job. The other case is when the current job is terminated, but the worker obtains another acceptable offer before the beginning of the next period.

In order to incorporate the information of transitions, one can look into the types of discrete durations. Let N be a week that is unemployed and E be a week that is employed.

For the case of N-N-N- ... -N-N-N-E, the discrete density function of the unemployment duration (t_n) interval, P_1 , is

$$(2.7) \quad P_1(t_n) = (\lambda_{nn})^{t_n-1} \lambda_{ne} \\ = [\alpha F(w_n) + (1 - \alpha)]^{t_n-1} \{\alpha [1 - F(w_n)]\}$$

The reason for using (t_i-1) rather than t_i in the superscripts is that the first period of each interval has been included in the previous transition. Similarly, for the case of E-E-E- ... -E-E-E-N, the discrete density function of the employment duration (t_e) interval P_2 , can be written as

$$(2.8) \quad P_2(t_e) = (\lambda_{ee})^{t_e-1} \lambda_{en} \\ = \{(1 - \delta) + \delta \alpha [1 - F(w_n)]\}^{t_e-1} * [\delta \alpha F(w_n) + \delta (1 - \alpha)]$$

For the cases of open-ended t_i -period intervals, such as N-N-N-...-N-N-N or E-E-E-...-E-E-E, the probabilities of continuing in the same state are

$$(2.9) \quad P_3(t_n) = (\lambda_{nn})^{t_n-1} \\ = [\alpha F(w_n) + (1 - \alpha)]^{t_n-1}$$

and

$$(2.10) \quad P_4(t_e) = (\lambda_{ee})^{t_e-1} \\ = \{(1 - \delta) + \delta \alpha [1 - F(w_n)]\}^{t_e-1}$$

respectively. Consequently, the structural-form duration/transition likelihood, L , is a product of the various P_m 's, $m = 1,2,3,4$, matching (2.7), (2.8), (2.9), and (2.10) for each individual:

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$$(2.11) \quad L = \prod_{\text{all individuals}} \left(\prod_{m=1}^4 P_m(t) \right)$$

For values of w_n (obtained from the reservation wage equation), α , δ , and the parameters of F can be obtained from MLE.

2.3 The Impact of Unexpected and Expected Inflation

This section explicitly presents the impact of unexpected inflation on transition rates. Because employed persons are assumed to work under long-term, real wage contracts and actual and reservation wages are in real terms, expected inflation is not an explanatory factor. To analyze the impact of unexpected inflation, an inflationary expectation mechanism should first be specified. This paper adopts a rational expectation mechanism as utilized by Barro [1977] and Mishkin [1983]. Details are discussed in section IV. Under long-term, real wage contracts and a static environment, where the reservation wage equation is identified by the variable EXPERIENCE (number of weeks employed since 1978), it can be argued that actual inflation leaves actual real wages and thus the mean of the wage offer distribution unchanged. A fully anticipated price inflation will not change real terms, including the transition rates. Only unexpected price inflation will lower the value of real reservation wages and change the transition rates. Given the probability of wage offer arrivals α , an unexpected inflation hike increases the transition probability from unemployment to employment and decreases the transition probability from employment to unemployment.

The impact of unexpected inflation on transition rates occurs through its influence on reservation wages. Hence its impact can be measured as the difference between the two sets of transition rates: One set is obtained from $\{F(\mu, s), w_n^A, \alpha, \delta\}$. The other set is derived from $\{F(\mu, s), w_n^B, \alpha, \delta\}$. $F(\mu, s)$ is the true real wage offer distribution characterized by its mean, μ , and its standard error, s , and w_n^A and w_n^B are two real reservation wages corresponding to different inflationary surprises.

III. THE DATA

The data set employed in this analysis is the male sub-sample of the 1979 Youth Cohort of the National Longitudinal Surveys (NLSY) over the period 1980 to 1983. The NLSY was first conducted in 1979. Its sampling population, with

ages ranging from 14 to 21 on January 1, 1979, includes ten noninstitutional groups covering three races (black, Hispanic and non-black-non-Hispanic), both sexes, disadvantaged economic status, and military personnel (see the NLS Handbook). The information, collected for the same individuals over time, is gathered through yearly interview. But some weekly data, such as labor market status (employment or unemployment) and job spells, are available through retrospective questionnaires. Compared with other age groups, this age group has the least family responsibility. Additionally, choosing this age group minimizes the effect of finite life (time horizon) on decisions. Females' social role are more complex than those of males and in ways that may affect the transition structure. Thus young females are not included.

The NLSY provides an exact beginning and ending date for each job. Therefore, the transitions between employment and unemployment are clear. The duration spells for employment or unemployment and experience on the labor market since 1978 (EXPERIENCE) can be easily constructed in weeks. Weekly wage earnings are calculated by the product of the hourly wage rate and forty work hours per weeks. The hourly wage rate is obtained from responses to direct questions on rate of pay and the time dimension of the pay period. Forty hours per work-week is enforced to avoid the possible wage bias caused by part-time and over-time job workers. Nominal wages are deflated by the Consumer Price Index level to become real wages. Relevant social and psychological characteristics (AFQT score, MARITAL STATUS, race, and SMSA) are directly available.

For the purpose of this paper, one sub-data selection criterion is employed. It follows in part Gonul's [1985] judgement of the equivalence of unemployment and being out of the labor force. Hence, only males who obtained their high school diploma in the year of 1979 are included and persons who were involved in any military service between 1980 and 1983 are excluded. Only 585 out of 12,686 are qualified. This criterion makes it impossible to estimate the impact of the potentially relevant variable "education" on the transitional behavior in the labor market. Military personnel are excluded because a soldier does not have the same freedom to choose the preferred state in the labor market as a civilian. As a further step, those youth who did not provide complete information on their characteristics such like AFQT and race, or their working history, or corresponding wage information are eliminated. Following the various restrictions on the sample, 168 persons and 34,944 (168 persons over 208 weeks in four years) weekly intervals are used. In the NLSY, except for the first survey year (1979), respondents were asked to list up to five jobs worked since the last interview and report one wage per job. Thus, there are at most 3,360 observations on wage information. However, many

respondents worked fewer than five jobs (two out of 168 did not work at all), and some did not give all the information needed here. Therefore, only 813 weeks are actually constructed for the wage equation estimation. The last job interval may be truncated at the end of 1983. All included variables are those as of the last week of each job interval.

IV. ESTIMATION

To analyze the impact of unexpected and expected inflation on labor market transitions, an inflationary expectation mechanism must first be specified. This paper adopts a rational expectation mechanism as utilized by Barro [1977] and Mishkin [1983]. A quarterly Consumer Price Index (CPI) inflation is used as a proxy for actual inflation. A quarterly CPI inflation equation, determined by Granger's criteria in selecting explanatory variables, is estimated to predict expected inflation. Thereafter, the inflationary surprise in each week is measured as the difference between actual inflation and the corresponding inflationary expectation.

The wage information, available only for intervals of employment, is deflated by the CPI level and then corrected for selectivity bias using a two-stage estimation method. Actual nominal wages are assumed to be revised according to actual price inflation under long-term, real wage contracts. Hence, the impact of unexpected and expected inflation does not enter into real wage determination. No statistically significant selectivity bias is found. Since a series of reservation wages is essential to a structural-form transition model, real reservation wages are next derived following the two-stage estimation method. Expected price inflation will increase nominal reservation wages proportionally. Thus a real reservation wage equation does not include expected inflation. Only the unexpected inflation will affect the real reservation wage. A maximum-likelihood technique is then used in a structural transition model to estimate the parameters of the true wage offer distribution. The unknown wage offer distribution, F , is assumed to be log-normal in order to perform the estimation. Implied transition rates are calculated when all parameters become available. The impact of unexpected inflation on transition rates appears through its influence on the real reservation wage.

4.1 Proxy for Actual and Expected Inflation

In this paper, a proxy for actual inflation \dot{CPI}_t is the growth in the quarterly

Consumer Price Index (CPI, 1980 = 100):

$$(4.1) \quad \dot{CPI}_t = (\Delta CPI_t / CPI_{t-1})$$

Expected price inflation is assumed to follow a rational expectation mechanism and is found first by treating the growth in the quarterly CPI as a function of its own past figures (which are added four more lag values stepwise, back to 28 lags, see table 3) and then as a function of the following quarterly variables:

(\dot{CPI}_{t-i} lag-i period of CPI growth (the change of CPI level),
i.e., ($\Delta CPI_{t-i} / CPI_{t-i-1}$))

($\dot{M1}_{t-i}$ lag-i period of a monetary aggregate M1 growth,

TB_{t-i} lag-i period of 3-month Treasury-bill rate,

(\dot{GNP}_{t-i} lag-i period of nominal gross national product growth,

TU_{t-i} lag-i period of total unemployment rate)

using the Granger test criteria.

By the significance of likelihood ratio test and the highest value of R^2 for combination of various sets of independent variable (see table 4), the final form of expected inflation follows column (2) of table 4. That is,

$$(4.2) \quad \dot{CPI}_t^e = 0.04 + 0.35 \dot{CPI}_{t-1} - 0.37 \dot{CPI}_{t-1} + 0.23 \dot{CPI}_{t-3} + 0.24 \dot{CPI}_{t-4} \\ (2.69) \quad (1.71) \quad (1.73) \quad (0.96) \quad (1.16) \\ - 0.01 TU_{t-1} + 0.01 TU_{t-2} - 0.01 TU_{t-3} + 0.001 TU_{t-4} \\ (1.96) \quad (1.39) \quad (1.45) \quad (0.38) \\ + 0.15 \dot{M1}_{t-1} + 0.13 \dot{M1}_{t-2} + 0.13 \dot{M1}_{t-3} + 0.12 \dot{M1}_{t-4} \\ (1.80) \quad (1.53) \quad (1.48) \quad (1.28)$$

4.2 The Estimation of Reservation Wages

Observed wages have a selectivity bias problem because only those workers who accept jobs report their wages. People who reject jobs do not report their unacceptable wage offers. Hence, the lower tail of the wage offer distribution is censored. Conventionally, one specification error term is designated to the wage equation while another specification error term applies to the reservation wage equation.

TABLE 1

VARIABLE DEFINITIONS

WHITE: A dummy equal to one if the individual's race is white, zero otherwise.

AFQT: This variable, Armed Forces Qualifying Tests, serves as a proxy for IQ and contains only a part of Armed Services Vocational Aptitude Battery vocational tests. AFQT adds up scores of arithmetic reasoning, word knowledge, paragraph composition, and some the numerical operations.

MARITAL STATUS: A dummy equal to one if the individual has ever been married, zero otherwise.

SMSA: A dummy equal to one if the individual lives in a Standard Metropolitan Statistical Area, zero otherwise.

EXPERIENCE: Number of weeks employed since 1978, the first survey of the Youth Cohort of the NLS.

UNEMPLOYMENT RATE: Weekly adjusted unemployment as percent of civilian labor force, derived from monthly unemployment data in the *Main Economic Indicators* [1984].

SUMMER QUARTER: A quarterly dummy equal to one if it is in June through August, zero otherwise.

AUTUMN QUARTER: A quarterly dummy equal to one if it is in September through November, zero otherwise.

WINTER QUARTER: A quarterly dummy equal to one if it is in December through February, zero otherwise.

EXPECTED (PRICE) INFLATION: Expectation of growth of the quarterly CPI, obtained from equation (4.2), $(\Delta \text{CPI}_t / \text{CPI}_{t-1})^e$.

UNEXPECTED (PRICE) INFLATION: A proxy is constructed from the difference between the growth in the quarterly CPI and the growth expectation in the quarterly CPI, $(\Delta \text{CPI}_t / \text{CPI}_{t-1} - (\Delta \text{CPI}_t / \text{CPI}_{t-1})^e$

$\dot{\text{CPI}}_t$: Quarterly CPI Growth = $(\Delta \text{CPI}_t / \text{CPI}_{t-1})$.

TU: Quarterly Unemployment Rate.

$\dot{\text{M1}}$: Quarterly M1 Growth.

TB: 3-month Treasury-bill rate.

$\dot{\text{GNP}}$: Quarterly Nominal GNP Growth.

TABLE 2
DATA DESCRIPTIONS
FOR THE ESTIMATION OF INFLATION EXPECTATION EQ.

VARIABLES (N = 36 ^a)	MEAN	MAXIMUM	MINIMUM
\dot{CPI}_t	0.0189	0.039	-0.002
\dot{CPI}_{t-1}	0.0193	0.039	-0.002
\dot{CPI}_{t-2}	0.0198	0.039	-0.002
\dot{CPI}_{t-3}	0.0203	0.039	-0.002
\dot{CPI}_{t-4}	0.0211	0.039	-0.002
TB_{t-1}	8.7769	15.040	4.300
TB_{t-2}	8.7306	15.040	4.300
TB_{t-3}	8.6543	15.040	4.300
TB_{t-4}	8.6294	15.040	4.300
$\dot{M1}_{t-1}$	0.0181	0.060	-0.002
$\dot{M1}_{t-2}$	0.0180	0.060	-0.002
$\dot{M1}_{t-3}$	0.0174	0.060	-0.002
$\dot{M1}_{t-4}$	0.0167	0.060	-0.002
TU_{t-1}	7.6686	10.600	5.700
TU_{t-2}	7.5886	10.600	5.700
TU_{t-3}	7.4600	10.600	5.700
TU_{t-4}	7.3114	10.600	5.700
\dot{GNP}_{t-1}	0.0239	0.053	-0.004
\dot{GNP}_{t-2}	0.0236	0.053	-0.004
\dot{GNP}_{t-3}	0.0232	0.053	-0.004
\dot{GNP}_{t-4}	0.0234	0.053	-0.004

FOR THE ESTIMATION OF ACTUAL WAGE EQ.

VARIABLES (N = 813)	MEAN	MAXIMUM	MINIMUM
WHITE (%)	74.05		
AFQT ^b	65.30	105.0	10.5
MARITAL STATUS (%)	18.94		
SMSA (%)	66.79		
EXPERIENCE (IN WEEKS)	145.59	313.0	2.0
UNEMPLOYMENT RATE (%)	8.30	10.7	6.3
SUMMER QUARTER (%)	12.79		
AUTUMN QUARTER (%)	7.87		
WINTER QUARTER (%)	5.26		
$Z_1\hat{\gamma}$	0.961	3.335	-1.358
MILL'S RATIO $\hat{\lambda}_{1i}$	0.399	1.819	0.002
ACTUAL REAL WAGE ^c (in LOG \$ per week)	5.100	6.835	2.187

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**FOR THE ESTIMATION OF PROBIT (PROBABILITY OF
WORKING) EQ. AND RESERVATION WAGE EQ.**

VARIABLES (N = 34944 ^d)	MEAN	MAXIMUM	MINIMUM
WHITE (%)	69.64		
AFQT ^b	64.78	105.0	10.5
MARITAL STATUS (%)	15.48		
SMSA (%)	69.58		
EXPERIENCE (IN WEEKS)	126.92	313.0	0.0
UNEMPLOYMENT RATE (%)	8.52	10.7	6.3
SUMMER QUARTER (%)	25.48		
AUTUMN QUARTER (%)	25.00		
WINTER QUARTER (%)	24.04		
EXPECTED INFLATION ^f (= $(\Delta \text{CPI}_t / \text{CPI}_{t-1})^e$)	0.0176	0.0358	-0.00059
UNEXPECTED INFLATION (= $(\Delta \text{CPI}_t / \text{CPI}_{t-1}) - (\Delta \text{CPI}_t / \text{CPI}_{t-1})^e$)	0.0002	0.00079	-0.00772
PROB. OF WORKING (%)	69.84		
$Z_1 \hat{\gamma}$	0.701	3.335	-2.031
RESERVATION WAGE (in LOG \$ per week)	5.049	5.437	4.507

^a. From the second quarter of 1975 to the last quarter of 1983.

^b. This variable, Armed Forces Qualifying Tests, contains only a part of Armed Services Vocational Aptitude Battery vocational test. AFQT adds up scores of arithmetic reasoning, word knowledge, paragraph composition, and half of the numerical operations.

^c. REAL WAGES = Weekly Earnings/Quarterly Consumer Price Index at that week

^d. 34944 is the product of 168 persons times 208 weeks (1980-1983).

^e. EXPECTED INFLATION follows equation (4.2). UNEXPECTED INFLATION is measured as the difference between $(\Delta \text{CPI}_t / \text{CPI}_{t-1})$ and the corresponding $[(\Delta \text{CPI}_t / \text{CPI}_{t-1})^e]$.

TABLE 3

RESULTS OF SOME LIKELIHOOD RATIO TESTS ON SELECTING
LAG LENGTHS FOR THE QUARTERLY CPI GROWTH

INDEPENDENT VARIABLES ^a	(1)	(2)	(3)	(4)	(5)	(6)
\dot{CPI}_{t-i} , $i = 1,2,3,4$	yes ^b	yes	yes	yes	yes	yes
\dot{CPI}_{t-i} , $i = 5,6,7,8$	yes	yes	yes	yes	yes	yes
\dot{CPI}_{t-i} , $i = 9,10,11,12$		yes	yes	yes	yes	yes
\dot{CPI}_{t-i} , $i = 13,14,15,16$			yes	yes	yes	yes
\dot{CPI}_{t-i} , $i = 17,18,19,20$				yes	yes	yes
\dot{CPI}_{t-i} , $i = 21,22,23,24$					yes	yes
\dot{CPI}_{t-i} , $i = 25,26,27,28$						yes
H_0	$\dot{CPI}_{t-i}=0$ $i=5\text{to}8$	$\dot{CPI}_{t-i}=0$ $i=9\text{to}12$	$\dot{CPI}_{t-i}=0$ $i=13\text{to}16$	$\dot{CPI}_{t-i}=0$ $i=17\text{to}20$	$\dot{CPI}_{t-i}=0$ $i=21\text{to}24$	$\dot{CPI}_{t-i}=0$ $i=25\text{to}28$
Likelihood Ratio ^c	8.91	1.03	4.89	10.24 ^d	16.89 ^d	20.57 ^d
R^2	0.737	0.744	0.777	0.834	0.898	0.943
D.W.	2.058	2.086	2.299	2.123	2.185	2.464

a. \dot{CPI}_t = Quarterly CPI growth = $(\Delta CPI_t / CPI_{t-1})$

b. 'yes' represents independent variables included for an OLS regressing on

$$\dot{CPI}_t. \quad \dot{CPI}_t = \sum_{i=1}^4 \beta_i \dot{CPI}_{t-i} \text{ is the final choice.}$$

c. Statistic $(n \log (SSR^r / SSR^u)) \sim X^2(4)$ (d.f. = number of i in H_0)

where n = number of observation = 35

(from the second quarter of 1975 to the fourth quarter of 1983)

SSR^r = restricted sum of squares error (in this case, coefficients of additional independent variables are restricted to be zero.)

SSR^u = unrestricted sum of squares error.

d. Statistically significant at the .05 level.

TABLE 4

**RESULTS OF SOME LIKELIHOOD RATIO TESTS
ON DETERMINING EQUATION (4.2)**

INDEPENDENT VARIABLES ^a	(1)	(2)	(3)	(4)	(5)	(6)	(7)
\dot{CPI}_{t-1} , $i = 1,2,3,4$	yes ^b	yes	yes	yes	yes	yes	yes
TU_{t-1} , $i = 1,2,3,4$	yes	yes	yes	yes		yes	yes
$\dot{M1}_{t-1}$, $i = 1,2,3,4$		yes	yes	yes			
TB_{t-1} , $i = 1,2,3,4$			yes		yes	yes	yes
\dot{GNP}_{t-1} , $i = 1,2,3,4$				yes			
Likelihood Ratio ^c	17.95 ^d	11.53 ^d	6.38	3.34	15.11 ^d	7.25	10.24 ^d
R^2	0.797	0.854	0.878	0.868	0.780	0.836	0.836
D.W. Statistics	1.975	1.938	1.788	1.928	2.069	1.884	1.884
H_0	$TU_{t-i}=0$ ⁽¹⁾	$\dot{M1}_{t-i}=0$ ⁽²⁾	$TB_{t-i}=0$ ⁽³⁾	$\dot{GNP}_{t-i}=0$ ⁽⁴⁾	$TB_{t-i}=0$ ⁽⁵⁾	$TB_{t-i}=0$ ⁽⁶⁾	$TU_{t-i}=0$ ⁽⁷⁾

a. \dot{CPI}_{t-1} = Quarterly CPI growth = $(\Delta CPI_t / CPI_{t-1})$

TU = Quarterly Unemployment Rate

$\dot{M1}$ = Quarterly M1 Growth

TB = 3-month Treasury-bill Rate

\dot{GNP} = Quarterly Nominal GNP Growth

b. 'yes' represents independent variables included for an OLS regressing on \dot{CPI}_t .
Column (2) is the final choice.

c. Statistic $(n \log (SSR^r / SSR^u)) \sim X^2(4)$ (d.f. = number of i in H_0)

Where n = number of observation = 35

(from the second quarter of 1975 to the fourth quarter of 1983)

SSR^r = restricted sum of squares error (in this case, coefficients of additional independent variables are restricted to be zero.)

SSR^u = unrestricted sum of squares error.

d. Statistically significant at the .05 level.

As a result, a two-stage estimation method can be employed to correct the selectivity bias.

Consider a model (in which there is no fixed cost of work) of an individual's information interval (week) i , where the observed wage equation is specified as

$$(4.3) \quad \text{LOG}(w_i) = D_{1i} b_1 + e_{1i}$$

e_{1i} is assumed to be normally distributed with mean zero and variance σ_1^2 . The variable w_i is the recorded, observed real wage. D_{1i} is a row vector of explanatory variables,

$$D_1 = [\text{WHITE, AFQT, SMSA, EXPERIENCE, UNEMPLOYMENT RATE, SUMMER QUARTER, AUTUMN QUARTER, WINTER QUARTER}],$$

and b_1 is a conforming column vector of parameters.

Additionally, a reservation wage equation is specified as

$$(4.4) \quad \text{LOG}(w_{ni}) = D_{2i} b_2 + e_{2i}$$

where e_{2i} is assumed to be normally distributed with mean zero and variance σ_2^2 , w_{ni} is the real reservation wage. D_{2i} is a row vector of explanatory variables.

$$D_2 = [\text{WHITE, AFQT, SMSA, EXPERIENCE, UNEMPLOYMENT RATE, SUMMER QUARTER, AUTUMN QUARTER, WINTER QUARTER, MARITAL STATUS, UNEXPECTED INFLATION}],$$

and b_2 is a conforming column vector of parameters. EXPERIENCE is not included in D_2 because experience will not affect the value of time in a static environment. The marital status variable enters the reservation wage equation, but not the observed wage equation, because it is assumed that wage offers are independent of one's marital status while reservation wages are affected by marital status. The influence of inflation on the real reservation wage, $\text{LOG}(w_n)$, is reflected in "unexpected price inflation", rather than "expected price inflation" because the nominal reservation wages have accounted for the expected price inflation. Only unexpected inflation will affect the level of real reservation wages.

Define a dummy variable I for week i to be

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$$(4.5) \quad I_i = 1 \text{ iff } \text{LOG}(w_i) \geq \text{LOG}(w_{ni}) \\ 0 \text{ iff } \text{LOG}(w_i) < \text{LOG}(w_{ni})$$

which is equivalent to

$$(4.5') \quad I_i = 1 \text{ iff } e_i \leq z_i\gamma \\ 0 \text{ iff } e_i > z_i\gamma$$

$$\text{where } e_i = e_{3i}/\sigma, \quad e_{3i} = e_{2i} - e_{1i} \\ z_i\gamma = (D_{3i}b_3)/\sigma, \quad D_{3i}b_3 = D_{1i}b_1 - D_{2i}b_2 \\ \sigma^2 = \sigma_1^2 + \sigma_2^2 - 2\sigma_{12}$$

Then the standard correction for selectivity bias in the wage equation (4.3) is

$$(4.6) \quad \text{LOG}(w_i) = D_{1i}b_1 - g_1\hat{\lambda}_{1i} + \epsilon_{1i} \quad \text{for } I_i = 1$$

$$\epsilon_{1i} = e_{1i} + g_1\lambda_{1i} \\ \lambda_{1i} = f(z_i\gamma)/F(z_i\gamma)$$

where λ_{1i} is the set of additional terms generated by Mill's ratio method to correct for selective bias, f and F are the normal density and distribution functions respectively, and g_1 is the covariance of the errors e_{1i} and e_i . OLS estimation of equation (4.6) produces consistent estimates for b_1 and g_1 . The probit estimation result of equation (4.5') is reported in column (1) of table 5 and the estimation result of corrected wage equation (4.6) is reported in column (2) of table 5. Thereafter, the coefficients of the independent variables used to predict the reservation wage (equation (4.4)) are calculated and reported in column (3) of table 5.

Consistent with earlier work, the preliminary empirical results of table 5 indicate that the impact of "unexpected" inflation on transition rates is not significant, because the estimated impact of unexpected inflation on the reservation wage is not significant.

4.3 The Estimation of Transition Rates

After the series of predicated reservation wages is obtained, the likelihood transition equation (4.7) (the same as (2.11)) is estimated.

$$(4.7) \quad L = \prod_{\text{all individuals}} \{[(\lambda_{nn})^{t_n-1} \lambda_{ne}] * [(\lambda_{ee})^{t_e-1} \lambda_{en}] \\ * [(\lambda_{nn})^{t_n-1}] * [(\lambda_{ee})^{t_e-1}]\}$$

where t_e = durations of employment spells, t_n = durations of unemployment spells,

$$(4.8) \quad \lambda_{ne} = \alpha[1 - F[(w_{ni} - \mu)/s]]$$

$$(4.9) \quad \lambda_{nn} = \alpha F[(w_{ni} - \mu)/s] + (1 - \alpha)$$

$$(4.10) \quad \lambda_{en} = \delta - \alpha F[(w_{ni} - \mu)/s] + \delta(1 - \alpha)$$

$$(4.11) \quad \lambda_{ee} = (1 - \delta) + \delta\alpha[1 - F[(w_{ni} - \mu)/s]]$$

All parameters α , μ , s , and δ can be identified. With estimated α , μ , s , and δ , the transition rates can be obtained.

From the values reported in table 6, the wage offer arrival probability (α) is 5.3% per week, the termination rate (δ) is 1.3% per week, the mean (μ) of the log wage offer distribution is 5.178, and the standard error (s) of the distribution is 0.362. Finally, the transition rates defined in equations (4.8) through (4.11) can be calculated with available numerical parameters. Table 7 reports the predicted transition rates evaluated at the mean of the real reservation wage of the sample and the actual transition rates of all intervals. They are very close, with only 0.004 error. At the mean of the real reservation wage, the probability of accepting an offer is 0.6396 and the probability of rejecting an offer is 0.3604. The probability of receiving an acceptable offer is 0.0342. The predicted transition rate from employment to unemployment is 0.0126. Persons who have a job this period are likely (0.9874) to stay employed in the next period, while persons who cannot find a job current period are likely (0.9658) to remain unemployed the following period. The substantial difference between the transition probability and the transition rate from unemployment to employment is presumably due to a low probability (0.053) of receiving a wage offer.

An important feature of the model is estimating the sensitivity of transition rates to variations in various parameters of the system. Tables 8, 9, and 10 report the implied transition rates evaluated at the means of the independent variables,

TABLE 5
RESULTS OF A TWO STAGE ESTIMATION METHOD
IN OBTAINING RESERVATION WAGES

VARIABLES	(1)	(2)	(3)
	PROBIT	ACTUAL WAGE	RESERVATION WAGE
	(1 IF WORKING)	(REAL)	(REAL)
	EQ. (4.5') n = 34944	EQ. (4.6) n = 813	EQ. (4.4) n = 34944
CONST	1.935 * (30.072) ^a	4.820 * (37.480)	4.656 * (27.771) ^c
WHITE (1 if white)	0.304 * (15.879)	-0.096 (1.918)	-0.122 * (2.306)
AFQT	-0.005 * (13.097)	0.002 * (2.729)	0.003 * (3.069)
MARITAL STATUS (1 if ever married)	-0.041 (1.628)	N/A	0.003 (1.116)
SMSA (1 if in SMSA)	-0.203 * (10.965)	0.265 * (6.996)	0.283 (7.137)
EXPERIENCE (IN WEEKS)	0.013 * (80.158)	0.001 (1.533)	N/A
UNEMP_RATE	-0.298 * (40.367)	-0.006 (0.258)	0.020 (0.706)
SUMMER_QR	0.226 * (9.751)	-0.221 * (3.687)	-0.240 * (3.921)
AUTIMU_QR	-0.113 * (4.933)	-0.063 (0.890)	-0.053 (0.751)
WINTER_QR	-0.174 * (7.625)	-0.018 (0.395)	-0.003 (0.063)
UNEXPECTED INFLATION ^b	-2.614 (1.278)	N/A	0.222 (0.980)
MILL'S RATIO $\hat{\lambda}_{li}$	N/A	-0.132 (0.921)	N/A

$\hat{\sigma}_2 = 0.085$ (derived from the coefficient of EXPERIENCE)
 $\hat{\sigma}_1 = 0.239$, $\hat{\sigma}_1 = 0.489$; $\hat{\sigma}_{12} = 0.250$; $\hat{\sigma}_2 = 0.269$, $\hat{\sigma}_2 = 0.518$

a. Absolute values of T-ratios are reported in parentheses.

** represents significance at two-tail 5% level.

b. See Table 1 for definition.

c. The T-ratios for estimates of the reservation wage equation are calculated by applying a Taylor's expansion.

TABLE 6
ESTIMATED PARAMETERS FROM EQ. (4.7)

α	=	0.053	*
		(2.648)	
μ	=	5.178	**
		(27.667)	
s	=	0.362	
		(1.652)	
δ	=	0.013	**
		(17.562)	
L	=	-3053.200	

α = the probability of receiving a wage offer

μ = the mean of the actual wage offer distribution

s = the standard error of the actual wage offer distribution

δ = an exogenous probability of job loss

L = the maximum likelihood value

This table is a result of GQOPT, which is a maximum likelihood estimation package. T-ratios are reported in parentheses. '*' represents significance at two-tail 5% level. '**' represents significance at two-tail 1% level.

when AFQT, or UNEMPLOYMENT RATE, or UNEXPECTED INFLATION changes by one, two, or three standard deviations individually. When AFQT increases (decreases), other things being equal, table 8 shows that the transition rate from unemployment to employment, λ_{ne} , decreases (increases), while the transition rate from unemployment to unemployment, λ_{nn} , increases (decreases). The percentage changes in λ_{ne} are larger than the changes in λ_{nn} for each one-standard-deviation variation in either direction, because λ_{ne} has a lower base. The transition rates from

TABLE 7

**IMPLIED TRANSITION RATES
EVALUATED AT THE MEAN OF THE RESERVATION WAGE^a**

EQUATION		IMPLIED TRANSITIONS FROM TABLE 6	ACTUAL TRANSITIONS FOR 34,944 INTERVALS ^c
	$F[(w_n - \mu)/s]$	0.3604	—
	$1 - F[(w_n - \mu)/s]$	0.6396	—
(4.8) ^b	$\lambda_{ne} = \alpha \{1 - F[\]\}$	0.0342	0.0304
(4.9)	$\lambda_{nn} = \alpha F[\] + (1 - \alpha)$	0.9658	0.9696
(4.10)	$\lambda_{en} = \delta \alpha F[\] + \delta (1 - \alpha)$	0.0126	0.0126
(4.11)	$\lambda_{ee} = (1 - \delta) + \delta \alpha \{1 - F[\]\}$	0.9874	0.9874

- a. The mean of the log of the real reservation wages = 5.0490. Values of μ , s and α are reported in Table 6.
- b. λ_{ij} = the transition rate from state i to state j , $i, j = e$ or n , 'e' represents employment while 'n' represents unemployment.
Note that $\lambda_{nn} + \lambda_{ne} = 1$ and $\lambda_{en} + \lambda_{ee} = 1$.
- c. The number of unemployment to employment transition is 319, the number of unemployment to unemployment transition is 10,172, the number of employment to unemployment transition is 305, and the number of employment to employment transition is 23,980.

employment to either unemployment or employment are much the same. Changing UNEMPLOYMENT RATE, as shown in table 9, results in a similar observation, though it is half as large in absolute magnitude. As inflation misperceptions either worsen or improve, the transition rates change only a little, as is reported in table 10. Table 10 reinforces the claim that UNEXPECTED INFLATION does not substantially influence youths' transition rates.

Table 11 highlights the implied transition rates when one of the six dummy variables in the model changes. In deriving this table, a certain dummy variable equal to one is selected for one set of transition rates. Then the dummy variable is assumed to be zero for another set of transition rates. Comparing these two

TABLE 8
WHEN AFQT CHANGES BY ONE, TWO, OR
THREE STANDARD DEVIATIONS

VARIABLES	RESERVATION WAGE	λ_{ne}^a	λ_{nn}	λ_{en}	λ_{ee}
At mean values of all variables (for comparison)	5.0490	0.0342	0.9658	0.0126	0.9874
↑ AFQT by 1 std. deviation ^b	5.1113	0.0307	0.9693	0.0126	0.9874
↑ AFQT by 2 std. deviations	5.1736	0.0270	0.9730	0.0127	0.9873
↑ AFQT by 3 std. deviations	5.2360	0.0233	0.9767	0.0127	0.9873
↓ AFQT by 1 std. deviation	4.9866	0.0375	0.9625	0.0125	0.9875
↓ AFQT by 2 std. deviations	4.9243	0.0406	0.9594	0.0125	0.9875
↓ AFQT by 3 std. deviations	4.8619	0.0433	0.9567	0.0124	0.9876

a. λ_{ij} = the transition rate from state i to state j, i, j = e or n.
'e' represents employment, while 'n' represents unemployment.

Parameters of λ_{ij} , μ , s , α , and δ , are reported in Table 6.

Note that $\lambda_{nn} + \lambda_{ne} = 1$ and $\lambda_{en} + \lambda_{ee} = 1$.

b. The standard deviation of AFQT is 21.351.

TABLE 9

IMPLIED TRANSITION RATES
WHEN UNEMPLOYMENT RATE CHANGES
BY ONE, TWO, OR THREE STANDARD DEVIATIONS

VARIABLES	RESERVATION WAGE	λ_{ne}^a	λ_{nn}	λ_{en}	λ_{ee}
At mean values of all variables (for comparison)	5.0490	0.0342	0.9658	0.0126	0.9874
↑ UNEMP_RATE by 1 std. deviation ^b	5.0742	0.0328	0.9672	0.0126	0.9874
↑ UNEMP_RATE by 2 std. deviations	5.0995	0.0313	0.9687	0.0126	0.9874
↑ UNEMP_RATE by 3 std. deviations	5.1248	0.0299	0.9701	0.0126	0.9874
↓ UNEMP_RATE by 1 std. deviation	5.0237	0.0356	0.9644	0.0125	0.9875
↓ UNEMP_RATE by 2 std. deviations	4.9984	0.0369	0.9631	0.0125	0.9875
↓ UNEMP_RATE by 3 std. deviations	4.9731	0.0382	0.9618	0.0125	0.9875

a. See footnote a in Table 8.

b. The standard deviation of UNEMPLOYMENT RATE is 1.289.

TABLE 10

**IMPLIED TRANSITION RATES
WHEN UNEMPLOYMENT INFLATION CHANGES
BY ONE, TWO, OR THREE STANDARD DEVIATIONS**

VARIABLES	RESERVATION WAGE	λ_{ne}^a	λ_{nn}	λ_{en}	λ_{ee}
At mean values of all variables (for comparison)	5.0490	0.0342	0.9658	0.0126	0.9874
↑ UNEXPECTED INFLATION by 1 std. deviation ^b	5.0499	0.0341	0.9659	0.0126	0.9874
↑ UNEXPECTED INFLATION by 2 std. deviations	5.0508	0.0341	0.9659	0.0126	0.9874
↑ UNEXPECTED INFLATION by 3 std. deviations	5.0517	0.0340	0.9660	0.0126	0.9874
↓ UNEXPECTED INFLATION by 1 std. deviation	5.0481	0.0342	0.9658	0.0126	0.9874
↓ UNEXPECTED INFLATION by 2 std. deviations	5.0472	0.0343	0.9657	0.0126	0.9874
↓ UNEXPECTED INFLATION by 3 std. deviations	5.0463	0.0343	0.9657	0.0126	0.9874

a. See footnote a in Table 8.

b. The standard deviation of UNEXPECTED INFLATION is 0.004068

TABLE 11

**IMPLIED TRANSITION RATES
EVALUATED AT MEAN VALUES OF ALL BUT DUMMY VARIABLES**

VARIABLES	RESERVATION WAGE	λ_{ne}^a	λ_{nn}	λ_{en}	λ_{ee}
ALL WHITE (WHITE = 1)	5.0120	0.0362	0.9638	0.0125	0.9875
ALL NON-WHITE (WHITE = 0)	5.1338	0.0293	0.9707	0.0126	0.9874
ALL MARRIED (MARITAL STATUS = 1)	5.0519	0.0340	0.9660	0.0126	0.9874
ALL SINGLE (MARITAL STATUS = 0)	5.0484	0.0342	0.9658	0.0126	0.9874
ALL LIVED IN A SMSA area (SMSA = 1)	5.1349	0.0293	0.9707	0.0126	0.9874
ALL LIVED IN A NON-SMSA area (SMSA = 0)	4.8523	0.0436	0.9564	0.0124	0.9876
SUMMER QUARTER ^b	4.8839	0.0424	0.9576	0.0125	0.9875
AUTUMN QUARTER ^c	5.0708	0.0330	0.9670	0.0126	0.9874
WINTER QUARTER ^d	5.1214	0.0301	0.9699	0.0126	0.9874
SPRING QUARTER ^e	5.1243	0.0299	0.9701	0.0126	0.9874

a. See footnote a in Table 8.

b. SUMMER QUARTER = 1, AUTUMN QUARTER = 0, and WINTER QUARTER = 0.

c. SUMMER QUARTER = 0, AUTUMN QUARTER = 1, and WINTER QUARTER = 0.

d. SUMMER QUARTER = 0, AUTUMN QUARTER = 0, and WINTER QUARTER = 1.

e. SUMMER QUARTER = 0, AUTUMN QUARTER = 0, and WINTER QUARTER = 0.

sets of transition rates, the impact of a specific dummy variable switching from zero to one can be determined. Hence, from table 11, a WHITE person enjoys a higher λ_{ne} and a lower λ_{nn} because of his race while having nearly constant rates of λ_{en} and λ_{ee} ; a single person who becomes married does not have significantly different transition rates; an individual who moves from a non-SMSA area to a SMSA area has a reduced λ_{ne} and a higher λ_{nn} ; and the presence of SUMMER, among the influence of four quarters, results in the lowest reservation wage, the highest λ_{ne} , and the lowest λ_{nn} .

V. SUMMERY AND CONCLUSIONS

This paper establishes a structural-form transition model on a discrete time, two-state basis. It separates the probability of wage offer arrivals and the probability of transitions. A rational expectations mechanism is applied to the growth of the quarterly CPI in order to differentiate expected and unexpected inflationary components. Then the two-stage estimation method is utilized to obtain reservation wages. The impact of inflation on transition rates occurs through its influence on reservation wages. The evidence in this study supports the belief that unexpected inflation is not important in the determination of job transitions of young males. One's race (WHITE or non-WHITE) and the index of IQ (AFQT), residence in a SMSA, seasonality (particular SUMMER), and the total unemployment rate are far more relevant in the determination of youths' transition rates.

In using the growth in the monthly CPI as a proxy for actual inflation, a similar result to the case in which quarterly CPI growth is used can be derived. Again, unexpected inflation has little impact on the transition rates. Therefore, attempting to "fool" youths by unexpected inflationary policies in order to reduce their unemployment rate is unlikely to be successful. However, the government should not lessen its efforts to effectively reduce the total unemployment rate. The higher the total unemployment rate is, the lower the transition rate from unemployment to employment, and the higher the probability of staying unemployed (see table 9). Neither should public policy makers interpret the absence of significant relationship between unexpected inflation and the unemployment rate to mean that the control of inflation is not important, since inflationary uncertainty must attract productive resources from other activities into information collection. Without stable prices, society loses in one way or another. If keeping prices stable is not feasible, the government should at least improve the information dissemination process so that

information costs are minimized.

Because the magnitude of inflation may affect the probability of wage offer arrivals, this study can be extended by identifying the influence of inflation on the probability of wage offer arrival. Further studies might be done with separation of employed workers into those who are seeking work and those who are not, followed by an examination of the importance of this distinction on the estimation of labor market transition models. If the motive to search on-the-job is due to incomplete inflation adjustments perception of current wage offer, then the impact of unexpected inflation may be significant. Otherwise, the impact of inflation will remain small.

BIBLIOGRAPHY

- Barro, R. J., [1977]: "Unanticipated Money Growth and Employment in the United State," *American Economic Review*, 67, 101-115.
- De Groot, M. H., [1970]: *Optimal Statistical Decisions*, McGraw-Hill, New York.
- Flinn, C. and J. Heckman, [1982_a]: "Models for the Analysis of Labor Force Dynamics," in R. Basmann and G. Rhodes, eds., *Advances in Econometrics*, JAI Press, Greenwich, Conn.
- , [1982_b]: "New Methods for Analyzing Structural Models of Labor Force Dynamics," *Journal of Econometrics*, 18, 115-168.
- Gonul, F., [1985]: "A Methodology for Determining Whether Unemployment and Out-of-the-Labor-Force are Distinct States," mimeo, Ohio State University.
- Heckman, J., [1979]: "Selection Bias as a Specification Error," *Econometrica*, 47, 153-161.
- Lippman, S.A. and J. J. McCall, [1976_a]: "The Economics of Job Search: A Survey," *Economic Inquiry*, 14, 155-189, & 347-368.
- , [1976_b]: "Job Search in a Dynamic Economy," *Journal of Economic Theory*, 12, 365-390.
- Maddala, G. S., [1983]: *Limited-Dependent and Qualitative Variables in Econometrics*, Cambridge University Press, Cambridge, New York.
- Main Economic Indicators 1964-1983*, OECD Department of Economics & Statistics, Paris 1984.
- Mincer, J. and B. Jovanovic, [1981]: "Labor Mobility and Waages," in S. Rosen, ed, *Studies in Labor Markets*, University of Chicago Press, Chicago.
- Mishkin, F. S., [1983]: *A Rational Expectations Approach to Macroeconometrics; Testing Policy Ineffectiveness and Efficient Markets Models*, National Bureau of Economic Research, University of Chicago Press, Chicago.
- Mortensen, D. T., [1984]: "Job Search and Labor Market Analysis," Discussion Paper No. 594, Northwestern University.
- Olsen, R. J., [1985]: "The Value of Time and Wage Offers: Selection in Longitudinal Data," mimeo, Ohio State University.
- , [1982]: "Distributional Tests for Selectivity Bias and a More Robust Likelihood Estimators," *International Economic Review*, 23, 223-240.

- Parsons, D. O., [1973]: "Quit Rates Over Time: A Search and Information Approach," *American Economic Review*, 63, 390-401.
- _____ and W. H. Cho, [1989]: "Wage Expectations in the Current Job: The Consequences for Quit Behavior," mimeo, Ohio State University.