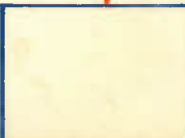
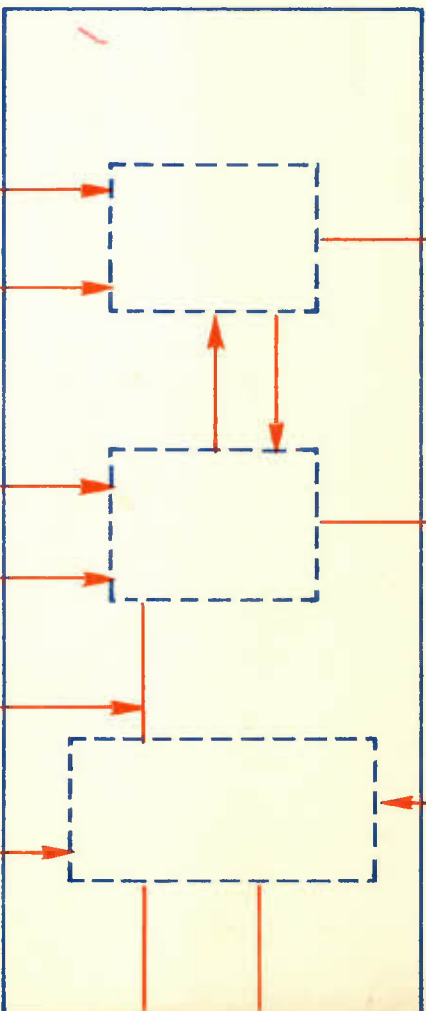
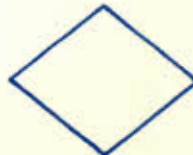
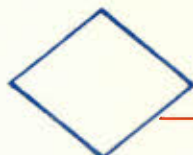
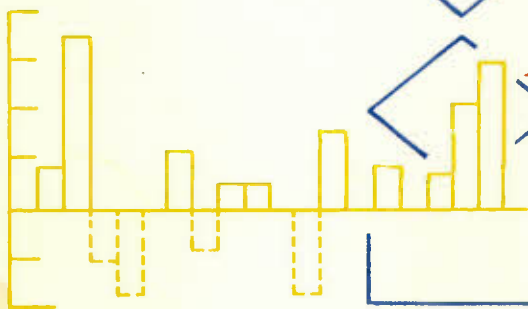


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DISCUSSION PAPER NO. 169

Search Unemployment and the Resulting Wage:  
A Test of Two Models with Canadian Data\*

by

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and  
Abrar Hasan

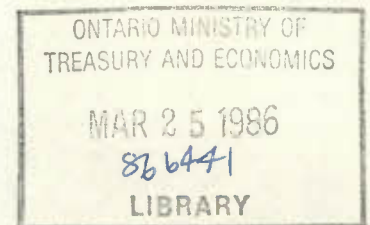
\* An earlier version of this paper was presented to the Graduate Workshop, Department of Economics, Carleton University, Ottawa and at the Eastern Economic Association Meetings, Montreal, May 9, 1980.

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## RÉSUMÉ

Dans les travaux théoriques sur la recherche d'emplois, le chômage est considéré comme une activité de recherche productive. Pendant qu'ils sont en chômage, ceux qui recherchent un emploi acquièrent des connaissances au sujet du marché du travail qui les aideront à maximiser leur revenu durant toute leur vie active. Ce point de vue comporte des conséquences importantes en matière de politiques publiques notamment pour ce qui concerne l'assurance-chômage. Dans ce contexte, il serait utile de connaître la relation qui existe entre la durée de la recherche et les salaires gagnés après la période de chômage.

Le document présente un essai de deux modèles du rendement de la recherche d'emplois, nommément, le modèle de recherche systématique et le modèle de recherche au hasard avec rappel, utilisant des données canadiennes. D'après le modèle de recherche systématique, le salaire attendu après la période de chômage diminuerait à mesure que se prolonge la période de recherche, tandis que l'inverse pourrait être vrai dans le cas du modèle de recherche au hasard avec rappel.

Nos résultats favorisent largement le modèle de recherche systématique dans le cas des hommes dans la force de l'âge, tandis que les femmes et les jeunes à la recherche d'un emploi adoptent volontiers la méthode du modèle de recherche au hasard avec rappel. Le choix d'une stratégie de recherche tiendrait donc à la nature "primaire" ou "secondaire" du marché du travail. Nous constatons également que le genre de cessation d'emploi constitue un important facteur du comportement du salaire attendu, compte tenu de la durée de la recherche : ceux qui abandonnent

volontairement leur emploi connaissent une diminution moindre  
(une plus forte augmentation) de salaire en fonction du prolonge-  
ment de la période de recherche.



## SUMMARY

Theoretical work on job search views unemployment as productive search activity. By remaining unemployed, searchers acquire labour market information that helps them to maximize their lifetime income. This view has important implications for public policy (for example, with respect to unemployment insurance). In this context, it would be helpful to know the relationship between duration of search and post-unemployment wages.

This paper presents a test of two models of returns to job search, namely, the systematic search model and the random-search-with-recall model, using Canadian data. According to the systematic search model, the expected post unemployment wage is expected to decline with increasing search time while the relationship is positive for the random-search-with-recall model.

Our results provide strong support to the systematic search model for prime age males while the search behaviour of females and young people is characterized by the random-search-with-recall model. This suggests that the choice of search strategy is dependent on the "primary" or "secondary" nature of the labour markets. We also find that the type of job separation is an important determinant of the behaviour of the expected resulting wage over search time: relative to those who are laid off, those who quit their jobs experience a lower decline (larger increase) in the resulting wage as search duration increases.

## ACKNOWLEDGEMENTS

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## I. Introduction

The relationship between duration of search and post-unemployment wage is an important issue for economic theory as well as for public policy. If, as search theory argues, job search is a productive investment of time and resources for finding an acceptable wage offer<sup>1</sup> then this may provide a rationale for public support of job search. However, search theory presents alternative models of the relationship between duration of search and post-unemployment wages, namely, the systematic search model and the random-search-with-recall model. Under one set of assumptions, the expected post-unemployment wage may decline with increasing search time (the systematic search model) while the reverse may hold true under another set of assumptions (the random-search-with-recall).

The usefulness of these models clearly depends on how well they accord with the realities of the labour market. Empirical studies of search theory, however, have concentrated on the relationship between search duration and reservation wage and it is now widely accepted that the reservation wage declines over the duration of search.<sup>2</sup> The relationship between expected resulting wage and expected search duration has received only limited empirical testing.



A recent study by Ehrenberg and Oaxaca (1976) casts some light on the nature of this relationship. In this work, the authors use a reduced form framework to examine the impact unemployment insurance benefits have on the duration of unemployment and on the resulting wage. The relationship between the duration of unemployment and the resulting wage was, however, not investigated directly.<sup>3</sup> More recently, Kahn (1978) has used U.S. data to test two models mentioned above which portray alternative relationships between search time and the post unemployment wage. His results suggest that the expected resulting wage declines as search time increases.

This paper applies Canadian data to test the systematic search model and the random-search-with-recall model. A simultaneous equation framework is used in which the resulting wage and duration of search are endogenous. In doing this we improve on the earlier analysis by incorporating the causes of job separation into our empirical model. We do this because a major criticism of search theory has been its failure to distinguish between voluntary and involuntary sources of unemployment.<sup>4</sup> Attempts have been made recently to incorporate quit decision into a theory of job search.<sup>5</sup> Moreover, empirical analyses have also pointed out the relevance of this variable.<sup>6</sup> The rationale for incorporating the causes of job separation is that individuals initiating a spell of unemployment

voluntarily (quits) are likely to have more information on job markets as compared with layoffs who are, by definition, forced into job search involuntarily. Hence voluntary quitting may lead to higher earnings than would be the case with the layoffs. In addition, there is another reason why involuntary turnover may cause lower earnings: layoffs may serve as a negative signal to prospective employers that the worker is less desirable than otherwise.<sup>7</sup>

Another advantage of our work is that the use of our particular data base permits us to avoid a number of deficiencies of earlier studies. While the theoretical models tested by Kahn (1978) make the assumption of finite time horizon, his empirical work does not control for this variable. This deficiency is removed from our analysis. Kahn also did not distinguish between duration of unemployment and duration of search and used incomplete spells of unemployment.<sup>8</sup> In our model we use the theoretically relevant concept of duration of search. This is possible because our data base has a longitudinal design so that we can measure changes that occur between consecutive and completed employment/unemployment episodes over time.

Our results provide strong support to the systematic search model for prime age males while the search behaviour of females and youths is characterized by the random-search-with-recall model. This suggests that the

relationship between duration of search and the resulting wage is dependent on the "primary" or "secondary" nature of labour markets. We also find that irrespective of the search model being used, quit/layoff distinctions are important in determining the behaviour of the resulting wage over search duration.

## II. Theoretical Framework

### A. The Determinants of the Expected Resulting Wage

MODEL I: Random-Search-with-Recall (Lippman and McCall (1976))

In this model it is assumed that the searcher knows the parameters of the distribution of wage offers for the labour market as a whole<sup>9</sup> but not the wage rate associated with a particular job or for particular firms. This information does not change over time. The wage offer distribution arises because employers hire individuals on the basis of a particular set of personal and employment characteristics, with the expectation of a certain level of productivity. Even if the searcher's skills are unvarying, prospective employers do not necessarily evaluate them equally; consequently, different firms offer different wages to the searcher.

The individual samples randomly from the wage distribution. All firms in which the individual's skills are used as factors of production are treated equally. The searcher contacts one firm per unit of search period, can retain job offers and resample firms. The searcher maximizes the present discounted value of expected life time income with a finite time horizon. In addition, the searcher conducts his job search according to a reservation wage (RW) strategy. The RW is the lowest wage at which an unemployed individual will accept a job. The RW is calculated so that the marginal cost of obtaining exactly one additional job offer is equal to the expected marginal return from one more offer. The RW declines over time due to the finite time horizon, i.e., a shorter time horizon remains as unemployment continues, making the returns to search smaller. Accordingly, if we define  $RW_t$  as the reservation wage in period  $t$  ( $t=1, 2, \dots, N$ ), then a wage offer ( $W_o$ ) in period  $t$  is accepted if  $W_o \geq RW_t$ . The probability that a wage offer is accepted is given by  $\gamma_t$ ,

$$\text{where } \gamma_t \equiv P(W_o \geq RW_t) = \int_{RW_t}^{\infty} F_t(W_o) dW_o \quad (1)$$

The probability of receiving a job offer is independent of the RW, while the RW is chosen taking into account the searcher's perception of his (her) wage offer distribution and the likelihood that he (she) will receive a job offer.



It follows that the lower the  $RW$ , the greater the probability of securing employment. If the probability of generating a job offer per unit of search time is fixed, then the expected duration of search  $E(D)$  is  $(1/\gamma)$ .

The implication of this model for the optimum search strategy is that the expected (as well as the actual) resulting wage will be a non-decreasing function of search duration. This happens because an increase in search time would indicate an increase in the number of sampled firms. Since more wage offers can be collected the longer the search duration, the larger is the expected number of offers retained and, therefore, the higher is the expected resulting wage.<sup>10</sup>

MODEL II: Systematic Search (Salop (1973))

In this model job searchers have prior information about expected wages and job opportunities in specific firms. Using this information to rank the firms according to the expected wage offers, they then search systematically starting with those firms with the "best opportunities", rather than randomly. The searchers are assumed to know, in addition to the wage offer distribution  $F(W_o)$ , the probability  $q_i$  of being hired by each sampled firm  $i$ . This information does not change over the course of search. Suppose that there are  $j$  firms where the  $i^{\text{th}}$  firm has an



expected wage (given employment) of  $w_i$ . Suppose further that,  $w_1q_1 = w_2q_2 = \dots = w_jq_j$  and  $w_1 \geq w_2 \geq \dots \geq w_n$ . The searcher maximizes the present discounted value of expected wealth with a finite time horizon. The searcher contacts exactly one firm per unit of search period, cannot retain job offers, and cannot resample firms.

The searcher conducts job search according to a reservation wage (RW) strategy. If a wage offer equals or exceeds this RW, it will be accepted and search will cease; otherwise the wage offer will be rejected and search will continue. The RW declines over search duration because of the finite time horizon and because workers tend to search systematically. As the searcher samples the firms in descending order of expected wage offers<sup>11</sup> he recalculates his RW at each step. The RW appropriate for a highly ranked firm will be too large for a lower ranked firm so that searching according to this systematic process gives rise to a declining RW as search continues.

Since searching proceeds over time, RW and the firms sampled must be subscripted by periods. Accordingly, let  $RW_t$  be the reservation wage in period  $t$  ( $t = 1, 2, \dots, N$ ) and let there be  $j$  ( $j = 1, 2, \dots, J$ ) firms in the market which the job seeker wishes to sample ( $N = J$ ). Then, if firm  $j$  is searched in period  $t$  and  $RW_t^j$  is the

reservation wage in period  $t$  at firm  $j$ ,  $\gamma_t^j$  is defined as the subjective probability of receiving an acceptable wage offer where,  $\gamma_t^j \equiv P(Wo_t^j \geq RW_t^j) = \int_{RW_t^j}^{\infty} F_t^j(Wo) dWo$  (2)

The implication of this model is that there will be negative relationship between the expected (as well as the actual) resulting wage and search duration.<sup>12</sup> This happens because the high-wage firms are sampled first.

In both models I and II, the expected resulting wage depends both on the distribution of wage offers and on the duration of search ( $D$ ). Thus, if  $W_i$  is expected resulting wage for individual  $i$ , then

$$W_i = g(F(Wo_i), D_i) \quad (3)$$

#### B. The Determinants of the Expected Duration of Search

The theory suggests that the expected duration of search depends on the reservation wage as well as on the wage distribution. Since search time ends when one accepts a job offer, explaining the expected duration of search is akin to explaining the RW.<sup>13</sup> In models I and II, the RW depends on the expected wage offer, the value of one's time

while unemployed and the resources available to finance search activities. Thus, if  $D_i$  is expected weeks of duration of search for individual  $i$ , then

$$D_i = h(F(W_{0i}), RW_i) \quad (4)$$

### III. Data and Estimation Procedure

The empirical work is based on the data drawn from the 1978 Labour Force Tracking Survey developed by the Canada Department of Industry, Trade and Commerce. This survey covers individuals from selected communities who were laid off or who voluntarily left their jobs as a result of a plant shutdown or a cutback in production. Survey teams gathered the list of such individuals from specific employers within designated localities and an attempt was made to contact each individual on the list. From the individuals contacted information was sought concerning their employment/unemployment records for the last five years, from 1973 to the cutoff date in summer 1978. The data relate to all completed unemployment episodes, single or multiple, as the case may be. Each episode contains information on pre- and post- unemployment wages, selected personal and human capital characteristics, and motivational and financial attributes of the individual and some characteristics of the household to which he/she belongs. When the data for all the years are pooled together, the

total sample consists of 12,302 observations out of which 1,962 relate to male quits, 870 to female quits, 7,821 to male layoffs and 1,649 to female layoffs. In our data set those individuals are included who had experienced some unemployment during the period 1973-78. The records have been arranged so that, for every person, each spell of unemployment is identified and can be classified as the result of a quit or a layoff.<sup>14</sup>

To test the predictions of Models I and II, a specific functional form must be assigned to  $g(\cdot)$  and  $h(\cdot)$  of equations (3) and (4) respectively. The following equations are estimated separately by sex for those who quit their jobs voluntarily and those who were laid off.<sup>15</sup>

$$\log W_t = a_0 + a_1 \text{ AGE} + a_2 \text{ AGESQRE} + a_3 \text{ EDUC} + a_4 \text{ AGEDUC} + \quad (5)$$

$$a_5 \text{ TRAINING} + a_6 \text{ DUREMP} + a_7 \text{ OCCUP} +$$

$$a_8 \text{ UNIONIZE} + a_9 \text{ FLXINDUS} + a_{10} \text{ FLXOCCUP} +$$

$$a_{11} \text{ FLXWAGE} + a_{12} \text{ LOOKBLLJ} + a_{13} \text{ URATE} +$$

$$a_{14} \text{ LOCPRE1} + a_{15} \text{ LOCPRE2} + a_{16} \text{ LOCPRE3} +$$

$$a_{17} \text{ LOCPRE4} + a_{18} \text{ LOCPRE5} + a_{19} \log T +$$

$$a_{20} D_t + e_1$$

$$D_t = b_0 + b_1 \text{ AGE} + b_2 \text{ AGESQRE} + b_3 \text{ EDUC} + b_4 \text{ AGEDUC} + \quad (6)$$

$$b_5 \text{ TRAINING} + b_6 \text{ DUREMP} + b_7 \text{ OCCUP} + b_8 \text{ UNIONIZE} +$$

$$b_9 \text{ FLXINDUS} + b_{10} \text{ FLXOCCUP} + b_{11} \text{ FLXWAGE} +$$

$$b_{12} \text{ LOOKBLLJ} + b_{13} \text{ URATE} + b_{14} \text{ LOCPRE1} +$$

$$b_{15} \text{ LOCPRE2} + b_{16} \text{ LOCPRE3} + b_{17} \text{ LOCPRE4} +$$

$$b_{18} \text{ LOCPRE5} + b_{19} T + b_{20} \text{ SPOUSEY} + b_{21} \text{ OTHERY} +$$

$$b_{22} \text{ SAVINGS} + b_{23} \text{ UIB} + b_{24} \text{ PRIMEARN} +$$

$$b_{25} \text{ DEPENDNT} + b_{26} \text{ MARITAL} + b_{27} \log W_{t-1} + e_2$$



The definitions of the mnemonic variable labels are described in an appendix.

Equations (5) and (6) are now discussed in the context of Models I and II. Equation (15) estimates the determinants of wage offers or resulting wage which is, in principle, distinct from estimation of  $RW$ .<sup>16</sup> In equation (5), the log of real weekly post-unemployment (when job was accepted) in period  $t$  is the dependent variable and is used as a proxy for the job offers that await job seekers. For each unemployed job seeker,  $W_t$  is assumed to be the best offer obtained or retained during the period of search. In both models I and II, the expected resulting wage depends both on the distribution of wage offers and on the duration of search. The wage offer distribution that an individual faces may be said to depend on (a) market productivity characteristics of the individual, and (b) local labour market conditions.

An individual's market productivity characteristics are captured by a number of variables, such as AGE, EDUC and TRAINING. These variables are expected to be positively associated with the expected resulting wage. There may be some non-linearities in AGE which are captured in the model by introducing AGESQRE ( $AGE^2$ ). Finally, we have available a direct measure of job tenure with previous



employer (DUREMP) which is used as a measure of experience instead of the conventional measure age-minus-education-minus-five.<sup>17</sup>

Labour market conditions clearly have an impact on expected wage offers but it is not clear from a search theoretic point of view what the relationship between labour market indicators and expected wage offers will be. It should be noted that search theory implies that workers will adjust their job search strategy in response to the market conditions in which the search is conducted. When the unemployment rate is high, job seekers may be forced to contact a greater number of potential employers. At the same time, confronted with a large number of applicants, employers may decide to offer lower wages. These considerations suggest a negative relationship between post-unemployment wages and unemployment rate. We use two variables to represent labour market conditions: (i) URATE, and (ii) LOCPRE1 to LOCPRE5.

Variables representing occupation (OCCUP) and unionization (UNIONIZE) represent both the labour market characteristics as well as the productivity characteristics of an individual. By the same token, whether or not an individual searches over different industries, FLXINDUS, or over different occupations, FLXOCCUP, would be an element in determining wage offers since mean wages differ among

industries and among occupations. Finally, two variables are introduced as controls. Whether an individual is willing to accept a wage cut (FLXWAGE) is a signal to employers. On-the-job search (LOOKBLLJ) is another variable of interest, and one that has been badly neglected in the search literature. In our sample, some individuals quit (were laid off) after beginning their search while employed while others quit (were laid off) first and then began their search. We hypothesize that, *ceteris paribus*, those who have searched while employed should know more about the job market and are therefore likely to exert a positive influence on expected resulting wage.

An important dimension of a job offer not usually considered in the search literature is the anticipated period of employment. The job seeker's time horizon depends on the time he expects to stay on his next job.<sup>18</sup> We introduce into our model the log of the actual tenure of the individual's next job ( $\log T$ ) as a proxy for expected tenure. We would expect a positive relationship between the resulting wage and tenure at the next job.<sup>19</sup>

Both Models I and II agree on the interpretation of all the explanatory variables (discussed above) except the variable "search duration" ( $D_t$ ). In Model I, duration of search ( $D_t$ ) is a proxy for the number of offers from which a maximum is to be chosen.<sup>20</sup> An increase in

search time would indicate an increase in the number of sampled firms. The larger the search duration, the larger is the expected number of offers retained and, therefore, the higher is the expected resulting wage. In Model II, the search duration is a proxy for the characteristics of the firm being sampled and  $W_t$  is the expected wage (given employment) that the firm pays. As discussed in Section II, the implication of this model is that the resulting wage will be negatively related to the duration of search.

Consider now the specification of equation (4). The expected duration of search depends on the reservation wage as well as on the wage distribution. In equation (6) (for both Models I and II), market productivity characteristics of the individual and local labour market variables again measure the distribution of wage offers. The implication of these models is that anything that influences the distribution of potential wage offers that an unemployed jobseeker faces, will influence his expected search time. Other things being equal, anything that raises the expected wage offer will also increase search time. Search theory predicts that the amount of time spent searching will be inversely related to the expected tenure ( $T$ ) at the next job the jobseeker ultimately finds.

Included in the factors affecting one's reservation wage ( $RW$ ) are financial variables such as the

jobseeker's pre-unemployment wages ( $\log W_{t-1}$ ), spouses income (SPOUSEY), other sources of income (OTHERY), availability of past savings (SAVINGS), whether or not the jobseeker received unemployment insurance benefits (UIB), whether the jobseeker is the primary earner in the family (PRIMEARN), number of dependents in the family (DEPENDENT), and the marital status of the jobseeker (MARITAL). Availability of non-wage income (SPOUSEY, SAVINGS, and OTHERY) allows a jobseeker to prolong his search by providing a cushion against his depleting household asset portfolio or the need to borrow. Other things being equal, anything that reduces the cost of being unemployed, (e.g., UIB) will increase an individual's expected duration of search. The three variables, PRIMEARN, DEPENDENT, and MARITAL, measure financial responsibilities and can be used as a proxy for discount rates. Other things being equal, anything that increases the individual's discount rate, will lead to a decrease in his expected duration of search. Finally,  $W_{t-1}$  should influence one's RW: other things equal, a jobseeker having quit or been laid off from a high-wage job is less likely to accept a low-wage job than otherwise.<sup>21</sup>

#### IV. Empirical Results

A number of econometric problems preclude estimating the model in equation (3) by ordinary least squares (OLS). First, the problem of selectivity bias



arises because equations (5) and (6) are estimated only for persons with positive values of duration of search and real weekly post-unemployment wages.<sup>22</sup> Moreover, the sample includes only those workers who could be contacted at the time of the survey. Highly mobile individuals, especially those who move out of the communities surveyed could not be contacted and as such they may be under-represented in the sample. Second, the fact that the duration of search itself is endogenous in the search process violates the OLS assumption that the variables on the right-hand side of the equation (3) are exogenous. Third, in a single equation framework one might interpret that the determinants of reservation wage (RW) rather than the determinants of wage offers are being estimated in equation (5). In that sense the estimated relationship between  $\log W_t$  and  $D_t$  may be interpreted as the relationship between the RW and duration of search ( $D_t$ ). In view of these difficulties we employ two-stage least squares (TSLS) to estimate equation (5).

Equation (6) is a reduced form equation. A structural equation estimating the determinants of the length of job search is not in principle identified in a system with equation (5). Because the financial variables directly influence the RW and hence the search time, and do not directly influence the expected wage offer at time  $t$ , equation (5) is identified. Equation (6) is estimated by OLS.



A. Resulting Wage Equation

Estimated parameters for equation (5) -- the resulting wage equation -- are presented in Tables 1 and 2 by sex for those who quit their previous jobs (Table 1) and those who were laid off (Table 2).

Our results provide strong support to the systematic search model for males, whether those who quit or those who are laid off. The coefficient of  $D_t$  is negative and statistically significant. This evidence suggests that male jobseekers conduct systematic job search, approaching firms in descending order of expected wage offers.<sup>23</sup> The systematic search model is rejected, however, for females. The coefficient of  $D$  is positive for females, both for quits and layoffs, and is statistically significant for the quits. These results support the random-search-with-recall model -- the expected wage offers increase as search time increases. A second result is that causes of job separation are important determinants of the behaviour of the expected resulting wage over search time: for both males and females we find that relative to layoffs, quits indicate a lower decline (larger increase) in the resulting wage as search duration increases. We now examine these two results in greater detail.

Choice of Search Strategy

Why do men and women use different search strategies? We suggest that the choice of search strategy is intimately related to the nature of job markets in which jobseekers are participating. Much has been written in recent years on the nature of dual or, more generally, segmented labour markets.<sup>24</sup> The primary labour markets are characterized by higher wages levels, greater degrees of specific human capital, greater stability of job attachment and most important the existence of internal job ladders. In the secondary market, on the other hand, production processes tend to involve simple repetitive tasks which many of the virtually infinite supply of untrained people can often learn quickly and easily. Anyone may enter this segment of the labour market, but the absence of internal job ladders prevents much upward mobility. Job turnover is consequently high. Youth and women are frequently identified as the major participants in the secondary markets while males dominate the primary sector. Although there is continuing debate on the merits of theories of labour market segmentation,<sup>25</sup> there is wide agreement on these stylized elements that distinguish primary sector from the secondary.<sup>26</sup>

In the present context we argue that the requirements of the systematic search model -- that the

jobseeker has information on wages paid by each prospective employer and can rank them in an order -- are more likely to be met by workers in the primary labour market. The secondary labour market is characterized by high turnover and mostly dead-end jobs with limited opportunities for internal promotion. Workers in this labour market are able to find many jobs if they are willing to accept the pay and working conditions. This feature approximates the re-call provision of the random-search-with-recall model. In light of these considerations we argue that the primary labour market is likely to encourage participants to search systematically. In the secondary labour market additional information about employer's characteristics appears relatively pointless and jobseekers are likely to fare just as well by following a random search strategy.

It is not suggested here that dual labour markets with all their stylized characteristics fit our sample. A degree of market segmentation is sufficient for our purposes. Similarly, all the males in our sample are not necessarily participants in the primary labour market nor are all the females assumed necessarily to be restricted to the secondary market. What is sufficient for our purposes is that relative to females a greater proportion of males are in the primary type and a smaller proportion in the secondary type job clusters. This contention is supported by a number of indicators. In our sample, real weekly wage

rates for males are significantly higher than for females. The sample consists mainly of low-wage manufacturing industries where skilled and semi-skilled blue collar trades are traditionally paid more than lower level white collar jobs<sup>28</sup>. The proportion of males in the white collar occupations is smaller than the females. Men are more unionized than are females. Their duration of previous job is also higher. While there is little difference in completed education, men do have higher levels of training.

A number of additional results in Tables 1 and 2 support our major conclusion. Notice that duration of employment with the previous employer (DUREMP) is significantly related to post-unemployment wage for males but is not significant for females. Previous tenure has been interpreted as a measure of job specific human capital<sup>29</sup> and the insignificance of this variable for females suggests that these jobs provide little specialized training. The coefficient for the occupation variable (blue or white collar) is, again, significant for males but not significant for females. This implies that the blue/white spectrum of jobs for women is quite different from the range occupied by men. Both these factors, specific human capital and nature of jobs, give credence to our conclusion that the clusters of jobs available for men and women are indeed very different. It is reasonable to assume, then, that persons



with specialized skills are likely to be more informed about their prospective employers. Persons with more general and easily learned skills, on the other hand, need not, to the same extent, seek out information about the characteristics of potential employers.

That males and females generally participate in two different types of job markets is also supported by evidence on the impact of URATE. While this variable is negatively related to post-unemployment wage for males it exerts a positive (significant for quits) impact for females. This evidence is consistent with the characterization of the secondary sector as a labour market which readily provides jobs despite high aggregate rates of unemployment.<sup>30</sup>

It may be argued that youths like the females, are also frequently identified as being primarily confined to the secondary labour markets and they should accordingly be treated separately. To examine this possibility we separated our sample of males into age categories of less than 25 years (young men) and 25 years or more (mature men). Our hypothesis is that mature men would exhibit systematic search while youths would not. This hypothesis is strongly supported by results (not reported here).<sup>31</sup> The coefficient of duration variable is negative and highly significant for both males and females. For young men, on



the other hand, the relationship is not significant for layoff cases. For quits the relationship is positive and highly significant, implying the use of random-search-with-recall strategy.

#### Impact of Causes of Job Separation

Our second major conclusion relates to the causes of unemployment, i.e., quit or layoff. Although the search strategy employed by males and females is different, the impact of quitting is, relative to layoffs, symmetrical in each case. The magnitude of the  $D_t$  coefficient indicates that the rate of decline of expected resulting wage is greater (or the rate of increase smaller) for layoffs relative to quits. In particular, for males, the absolute value of the coefficient of  $D_t$  is larger for quits than for layoffs. Two possible explanations are suggested. The first explanation may lie in quits being better informed about job markets. The argument here is that quitting implies pre-meditation, hence greater knowledge about job markets. Quits, therefore, are likely to have wage expectations closer to the real labour market conditions, hence their post-unemployment wage is likely to decline less than that of layoffs. A second explanation, which we find more convincing, regards the cause of job separation as a market signal. It has been argued that layoff status represents a signal to prospective employers

in that as seen by past employers the workers in question were receiving wages in excess of their productivity.<sup>32</sup> This factor can explain the relatively larger wage declines for layoffs as opposed to quits. For females, the value of the positive coefficient of  $D_t$  is substantially larger for quits relative to layoffs. This result conforms with the two explanations offered above.

Finally, the fact that most of the variables included in our postwage equation are statistically significant adds confidence to our specification and to the two conclusions we have drawn. We note in passing that, as outlined in Section III, our expectations of non-linearity in AGE are borne out, as are the expectations regarding tenure at the next job ( $\log T$ ).

#### B. Duration of Search Equation

The mean values of duration of search (D) suggest that those who lost their jobs experience, on average, longer unemployment (search) spells than those who left their jobs voluntarily. The estimates of the parameters of the duration of search equations for quits and layoffs are given in Table 3 and 4. For the sake of brevity, we shall confine our discussion to only a few variables.

First, jobseekers who received unemployment insurance on average remained unemployed for longer durations than those who did not receive such compensation. Specifically, the receipt of unemployment insurance benefits is associated with roughly two months additional duration of unemployment. These figures suggest that receipt of unemployment benefits has a very high marginal impact which appears to be quite stable across the male and female categories.

Second, although the predicted response of workers' unemployment duration varies with the source of non-wage income (SPOUSEY, SAVINGS, and OTHERY), the observation worth mentioning is that females are more responsive than males to the spouse's income. This result is not surprising since male earners' income is generally larger and is generally more stable. Contrarywise, the SAVINGS variable is significant in male equations but insignificant for females. The proxies for the discount rate (PRIMEARN, DEPENDENT, and MARITAL) are generally not significant.

Next, the unemployment rate (URATE) is another highly significant variable in each of the four equations, with a negative sign. One would expect a positive relationship on the assumption that job opportunities are scarce when unemployment rates are high and, therefore, it

takes longer to contact a vacancy. As Kiefer and Neumann (1979) point out this need not be the case if unemployment rate changes (a proxy for cyclical changes) are foreseen. Additionally, in our case URATE refers to provincial unemployment rates while individuals in our sample were drawn from communities which could experience different unemployment rates. The consistently negative impact of URATE may be interpreted as motivating individuals to exert intensive search efforts.

Finally, following Gronau (1971) we used (actual) tenure on the next job as a proxy for the time horizon. Search theory predicts a negative relationship between  $D_t$  and  $T$ . This hypothesis is supported as we find a statistically significant negative coefficient for  $T$ . The result is consistent across all the male and female equations.

## V. Conclusions

The Main results obtained here are:

- (i) A positive relationship between the length of job search and the resulting wage for females providing support to the random-search-with-recall model.



- (ii) A negative relationship between the length of job search and the resulting wage for males providing support to the systematic-search model.
  
- (iii) Relative to layoffs, quits indicate a lower decline (larger increase) in the resulting wage as search duration increases.

The major conclusion of this paper is that returns to search are dependent on the search strategy employed by workers. The search strategy in turn is conditioned by the nature of job markets. The decline of post-unemployment wage with search duration is in accord with the systematic search model which characterizes the behaviour of jobseekers in the primary labour market. In the secondary labour market searchers follow a random-search-strategy which involves the recall of offers and leads to an increase in the post-unemployment wage when search duration increases. A second conclusion of this paper relates to quits and layoffs. There is evidence that the layoff status of a worker acts as a negative signal to prospective employers so that post-unemployment wages fall more (or rise less) with increases in search duration relative to those who quit their jobs.

These conclusions have important theoretical as well as policy implications. On the theoretical plane, the under-pinnings of search theory and of segmented labour markets theory are generally portrayed as opposite theoretical poles. Results provided in this paper suggest that the search strategy employed by jobseekers are crucially dependent on the nature of labour markets themselves. In other words, search theory paradigm operates within the constraints imposed by segmented markets. In what may be treated as the primary market, jobseekers exhibit preference for the systematic search strategy. In the secondary labour market, in contrast, the random-search-with-recall model portrays jobseeker's behaviour more accurately. Rather than treating search-theoretic and segmented markets literature as irreconcilable, this paper offers evidence of the two paradigms working out in tandem. Hence, these results are important not only theoretically but also have policy implications. Greater availability of labour market information may contribute to changing the search strategy employed in the secondary labour market. However, its effect may be limited as long as other attributes of this labour market, principally the absence of an internal wage structure, do not manifest change.

Table 1

TWO-STAGE LEAST SQUARE (2SLS) ESTIMATES OF DETERMINANTS  
 OF EXPECTED WAGE OFFER OR RESULTING WAGE: QUIT SAMPLE  
 DEPENDENT VARIABLE:  $\log W_t$   
 (t-statistics)

Explanatory Variables	Male	Female
AGE	.020* (8.18)	.010** (2.14)
AGESQRE	-.0001* (8.01)	-.00008 (1.52)
EDUC	.007*** (1.85)	.013*** (1.82)
AGEDUC	-.0002*** (1.82)	-.0004 (1.44)
TRAINING	.013* (4.88)	-.004 (0.41)
DUREMP	-.00003*** (1.84)	-.000007 (0.19)
OCCUP	-.028* (3.38)	-.021 (1.49)
UNIONIZE	.033* (4.58)	-.012 (0.81)
FLXINDUS	.053* (4.08)	-.037 (1.60)
FLXOCCUP	-.058* (4.52)	.017 (0.73)
FLXWAGE	-.014** (2.02)	.009 (0.72)
LOOKBLLJ	.048* (6.55)	.027** (2.07)
URATE	-.004 (1.36)	.020* (3.39)
LOCPREI	-.068** (2.13)	-.10 (0.58)

Table 1 (Cont'd)

Explanatory Variables	Male	Female
LOCPRE2	-.121* (4.56)	-.273* (5.50)
LOCPRE3	-.108* (6.53)	-.179* (5.17)
LOCPRE4	.074* (4.56)	-.063*** (1.79)
LOCPRE5	-.095* (3.90)	-.049 (0.84)
log T	.022* (2.92)	.060* (4.53)
D <sub>t</sub>	-.001** (1.94)	.002* (3.20)
CONSTANT	-.185* (3.23)	-.461* (4.00)
R <sup>2</sup>	-	-
Number of Observations	1962	870
Mean of Real Weekly Post- Unemployment Wage Rate (in 1971 dollars)	122.46	86.84

\*significant at the 1% level  
 \*\*significant at the 5% level  
 \*\*\*significant at the 10% level



Table 2

TWO-STAGE LEAST SQUARE (2SLS) ESTIMATES OF DETERMINANTS  
 OF EXPECTED WAGE OFFER OR RESULTING WAGE: LAYOFF SAMPLE  
 DEPENDENT VARIABLE:  $\log W_t$   
 (t-statistics)

Explanatory Variables	Male	Female
AGE	.011* (15.74)	.004* (3.41)6*
AGESQRE	-.0002* (14.32)	-.0000 (3.55)
EDUC	-.001** (1.94)	-.0002 (0.17)2
AGEDUC	.00005* (3.37)	.0000 (0.75)8
TRAINING	.0003 (0.56)	.0000 (0.12)1
DUREMP	-.00004* (6.27)	-.0000 (0.68)
OCCUP	-.030* (4.97)	.002 (0.26)
UNIONIZE	.033* (4.97)	.025* (3.17)
FLXINDUS	.017* (2.56)	.019 (1.53)
FLXOCCUP	-.049* (7.28)	-.029* (2.34)
FLXWAGE	-.011* (2.89)	.012 (1.43)
LOOKBLLJ	.017* (4.43)	.005 (0.66)
URATE	-.006* (3.64)	.007 (1.56)
LOCPRE1	-.056** (3.56)	-.079 (1.48)

Table 2 (Cont'd)

Explanatory Variables	Male	Female
LOCPRE2	-.117* (9.83)	-.163* (5.90)
LOCPRE3	-.096* (13.96)	-.085* (5.17)
LOCPRE4	-.121* (15.64)	-.056* (3.37)
LOCPRE5	-.180* (12.41)	-.004 (0.11)
log T	.0006 (0.14)	.034* (3.37)
D <sub>t</sub>	-.003** (6.60)	.0009 (1.20)
CONSTANT	.151* (5.39)	-.204* (3.16)
<hr/>		
R	-	-
Number of Observations	7821	1649
Mean of Real Weekly Post- Unemployment Wage Rate (in 1971 dollars)	138.12	87.07

\*significant at the 1% level  
 \*\*significant at the 5% level  
 \*\*\*significant at the 10% level

Table 3

ORDINARY LEAST SQUARE (OLS) ESTIMATES OF DETERMINANTS  
OF SEARCH DURATION: QUIT SAMPLE  
DEPENDENT VARIABLE:  $D_t$   
(t-statistics)

Explanatory Variables	Male	Female
AGE	-.046 (0.10)	-1.195 (1.15)
AGESQRE	.006 (1.32)	.021*** (1.74)
EDUC	1.290** (2.09)	-.428 (0.28)
AGEDUC	-.031 (1.58)	-.005 (0.09)
TRAINING	-1.004** (2.28)	3.776** (2.07)
DUREMP	-.0003 (0.13)	.016** (2.07)
$\log W_{t-1}$	-2.661 (0.68)	24.472* (2.38)
OCCUP	-.251 (0.18)	-3.456 (1.19)
UNIONIZE	1.137 (0.92)	6.826* (2.35)
FLXINDUS	.237 (0.11)	6.576 (1.39)
FLXOCCUP	1.993 (0.91)	-3.644 (0.77)
FLXWAGE	-1.056 (0.88)	-.220 (0.08)
LOOKBLLJ	2.826* (2.37)	1.521 (0.55)
SPOUSEY	-.703 (0.35)	8.05** (2.17)
OTHERY	1.139 (0.52)	-3.779 (0.88)

Table 3 (Cont'd)

Explanatory Variables	Male	Female
SAVINGS	3.487* (2.61)	2.559 (0.96)
UIB	10.653* (8.50)	11.441* (4.23)
URATE	-1.656* (3.77)	-5.208* (5.37)
LOCPRE1	24.616* (5.30)	41.63 (1.18)
LOCPRE2	13.978* (3.30)	37.117* (4.06)
LOCPRE3	11.919* (5.02)	14.51** (2.02)
LOCPRE4	3.702* (1.35)	3.003 (0.40)
LOCPRE5	-10.264* (2.57)	-23.101** (1.99)
T	-.046* (3.36)	-.11* (-4.29)
PRIMEARN	-.436 (0.31)	1.865 (0.63)
DEPENDNT	-.255 (0.42)	.327 (0.33)
MARITAL	-.789 (0.50)	2.058 (0.53)
CONSTANT	6.85 (0.70)	62.18* (2.69)
R <sup>2</sup>	0.11	0.18
Number of Observations	1962	870
Mean of Dependent Variable (in weeks)	20.67	30.92

\*significant at the 1% level  
 \*\*significant at the 5% level  
 \*\*\*significant at the 10% level



Table 4

ORDINARY LEAST SQUARE (OLS) ESTIMATES OF DETERMINANTS  
 OF SEARCH DURATION: LAYOFF SAMPLE  
 DEPENDENT VARIABLE:  $D_t$   
 (t-statistics)

Explanatory Variables	Male	Female
AGE	.026 (0.25)	.014 (0.05)
AGESQRE	.0004 (0.35)	.0004 (0.10)
EDUC	-0.139*** (1.83)	-.337 (1.27)
AGEDUC	.003 (1.46)	.010 (1.49)
TRAINING	-.040 (0.70)	-.118 (0.85)
DUREMP	.004* (5.36)	.009* (3.10)
$\log W_{t-1}$	-4.061** (2.29)	5.783 (0.90)
OCCUP	-1.147 (1.52)	-2.437 (1.33)
UNIONIZE	.185 (0.36)	1.022 (0.59)
FLXINDUS	-1.413*** (1.69)	.219 (0.08)
FLXOCCUP	3.995* (4.92)	2.528 (0.97)
FLXWAGE	.011 (0.02)	4.489* (2.76)
LOOKBLJ	.393 (0.81)	-1.342 (0.84)
SPOUSEY	.962 (1.42)	3.759*** (1.71)
OTHERY	2.758* (2.59)	.827 (0.30)

Table 4 (Cont'd)

Explanatory Variables	Male	Female
SAVINGS	1.791* (3.53)	1.667 (1.07)
UIB	9.674* (12.79)	7.486* (3.73)
URATE	-1.823* (9.99)	-5.511* (8.51)
LOCPRE1	19.590* (12.41)	28.116* (2.65)
LOCPRE2	11.624* (8.93)	27.568* (6.59)
LOCPRE3	6.889* (9.28)	8.858* (2.71)
LOCPRE4	3.399* (3.47)	-5.128 (1.49)
LOCPRE5	-11.645* (6.75)	-31.211* (5.34)
T	-.060* (9.84)	-.138* (7.44)
PRIMEARN	-.195 (0.32)	2.777 (1.53)
DEPENDNT	.060 (0.52)	.209 (0.82)
MARITAL	-3.754* (6.15)	1.640 (0.71)
CONSTANT	25.09* (9.67)	60.23* (7.20)
R <sup>2</sup>	0.10	0.12
Number of Observations	7821	1649
Mean of Dependent Variable (in weeks)	23.64	31.61

\*significant at the 1% level  
 \*\*significant at the 5% level  
 \*\*\*significant at the 10% level

Footnotes

1. The search literature originated in Stigler (1961, 1962) and McCall (1970). Applications of the model to explain cyclical fluctuations in unemployment include Mortensen (1970) and Alchian (1970). Empirical tests are presented in Kiefer and Neumann (1979) and Barron and Mellow (1979). An excellent survey of the literature is contained in Lippman and McCall (1976).
2. A declining reservation wage is accepted by Kasper (1967), Holt (1970), Gronau (1971), Harnett, Cummings, and Hughes (1971), Salop (1973), Kiefer and Neumann (1979), and Hasan and Gera (1979). Some of the factors suggested for declining reservation wage are a finite time horizon (Gronau, 1971), a fall in the marginal utility of leisure (Kasper, 1967), higher psychic and anxiety costs (Holt, 1970), the depletion of assets and savings (Kasper, 1967), progression from more promising to less promising job possibilities (Salop, 1973), and greater risk propensity (Harnett, Cummings, and Hughes, 1971).
3. Some other studies, for example, Burgess and Kingston (1976), Classen (1977), and Holen (1977) also examine the effects of unemployment compensation on duration of unemployment and on wages or earnings in subsequent employment.
4. See Tobin (1972).
5. See, for example, Parsons (1973).
6. Cooke (1979).
7. Welch (1977) argues, that for "workers who are either laid off or fired, there is a clear signal to potential future employers that as seen by past employers (relative to conditions those employers faced when separations occurred) the workers in question were receiving wages in excess of productivity. As such it seems reasonable to consider the possibility of impaired future offers ..."
8. One problem which arises in most of the studies (see, for example, Ehrenberg and Oaxaca, 1975; Classen, 1977; Holen, 1977; and Kahn, 1978) in examining the search behaviour of individuals is that of incomplete spells of search duration. We construct a proper measure of length of job search as follows:

Duration of job search = total weeks between jobs  
(completed spell) minus  
weeks not searching for a job

9. In principle, this distribution is endogenous. See, for example, Rothschild (1973).
10. A second model by Lippman and McCall (1976), described as random-search-with-no recall, is identical to the first model except that individual cannot retain job offers. Since offers cannot be retained the expected wage offers in the  $n^{\text{th}}$  period of search has the same expected value as that for any other period. Other models such as that in Whipple (1973) assume that the worker knows the parameters of the distribution of wage offers for the labour market as a whole, but make no assumptions about the retainability of offers. Therefore, these models have no definite prediction about the relation between the expected resulting wage and duration of search.
11. It is important to note here that the searcher will sample the firms in descending order of expected wage offers. This result is proven in the case where the wage rate  $w_i$  paid by each firm  $i$  is known with certainty. Suppose there are two firms and two periods and the individual's rate of time preference is denoted by  $\rho$  so that his discount factor is  $1/1+\rho$  and assume, for simplicity, that he is risk neutral. Assuming  $w_1 > w_2$ , the condition  $w_1q_1 = w_2q_2$  still holds. The job seeker wishes to maximize the present discounted value (PDV) of expected wealth, choosing an optimum set of reservation wages for each period and an optimum search order of firms. Since the wages are known, an offer is never rejected (Salop, 1973, p. 196). The searcher therefore can follow one of two strategies:

Strategy I: Sample the high wage firm in period 1 and if there is no offer, sample the low wage firm in period 2.

Strategy II: Sample the low-wage firm in period 1, and if there is no offer, sample the high-wage firm in period 2.

Let  $E(WL_k)$  = present discounted value of expected wealth from Strategy  $k$

$$E(WL_I) = q_1 \left( w_1 + \frac{w_1}{1+\rho} \right) + (1 - q_1) \left( \frac{q_2 w_2}{1+\rho} \right)$$

$$E(WL_{II}) = q_2 \left( w_2 + \frac{w_2}{1+\rho} \right) + (1 - q_2) \left( \frac{q_1 w_1}{1+\rho} \right)$$



$$E(WL_I) - E(WL_{II}) = (w_1 - w_2) \left( \frac{q_1 q_2}{1 + \rho} \right) > 0$$

Therefore Strategy I is followed. A simple demonstration of this proof is given in Kahn (1978). A risk averse worker may well sample the low wage, high probability firm first (Salop, 1973).

12. This result may also follow from the random-search-with-no-recall model (Lippman and McCall, 1976), if the greater duration of an individual's search signals to the firms that the workers is less desirable than otherwise.
13. See, for example, Kahn (1978).
14. Two limitations of the data should be noted. First, the workers included need not be representative of the entire Canadian population or even of the unemployed population. This limitation is mitigated somewhat by inclusion in the sample of unemployment/employment history of the past five years. A second limitation of the sample is that it is also potentially affected by the contact rate. Highly mobile individuals, especially those who move out of the communities surveyed could not be contacted and as such they may be under-represented in the sample.
15. Note that temporary layoffs are not included in the analysis.
16. Previous empirical research such as Barnes (1975), Kasper (1967), and Stephenson (1976) have examined the wage changes (rather than levels) as the focus was on the time path of the reservation or asking wage of the unemployed job seeker.
17. See, for example, Kahn (1978).
18. Gronau (1971), p. 294.
19. Clark and Summers (1979) argue that the returns to job search depend critically on the expected tenure of the searcher's next job. If the anticipated job tenure is short, the return to job search is also likely to be low because the higher post-unemployment wages will be received only for a short time.
20. Kahn (1978).
21. Kahn (1978) argues that pre-unemployment wage probably influences one's perception of the wage distribution; it is not included in equation (5) because there should be no direct connection between pre-unemployment wage ( $W_{t-1}$ ) and actual future opportunities.

22. This procedure is equivalent to the first step of Amemiya's (1974) iterative process for simultaneous equations systems with truncated dependent variables. When those with zero values of D were included, the results did not change. It is thus likely, as pointed out by Kahn (1978), that use of the Amemiya procedure would add little information here.
23. These results are also consistent with the possibility that employers make job offers partly on the basis of length of unemployment. In the absence of much empirical evidence on this issue, this is certainly a subject for further research.
24. See, for example, Doeringer and Piore (1969); and Loveridge and Mok (1979). The criteria most often used in order to identify labour market segments include characteristics of occupations, industries or employers or all three. In terms of occupational criterion, an essential element of dual/segmented theories is that jobs can be sorted or grouped into clusters so that each cluster is characterized by highly intercorrelated and causally interrelated variables (Harrison and Sim, 1979). Wages, productivity, degrees of specific on-the-job training, the openness or closeness of internal labour markets are some of the key variables. Another key feature is that the mobility of workers among these clusters, while not absent, is severely limited. As a consequence of the foregoing, the observed behaviour of workers, in terms of job attachment, patterns of search, how they value alternative occupational choices, how the pooled labour-time of their families is organized is significantly affected by the type of labour market these workers are participating in.
25. Wachter (1974).
26. See Osterman (1975); and Rosenberg (1975).
27. Feldstein (1973).
28. It should be noted that in a recent paper Piore (1975) has distinguished between two segments of the primary sector and has placed high level blue collar skills in the lower level but primary sector.
29. See, for example, Kiefer and Neumann (1979).
30. For females, the positive and significant coefficient on the U-rate is interesting. This result may be capturing the predictions of the additional workers hypothesis suggesting that during slack periods female workers join (re-enter) the labour force and search more intently for higher wages to support the financial burden on the family.
31. Results available upon request.
32. Welch (1977).

APPENDIX

Variable Definitions

- $\log W_t$  = the logarithm of the real (in 1971 dollars)  
weekly post-unemployment wage (when job was  
accepted) in period t;
- AGE = actual age in years;
- AGESQRE = actual age in years squared;
- EDUC = years of schooling;
- AGEDUC = interaction variable, AGE x EDUC;
- TRAINING = years of formal training;
- DUREMP = length of last job (prior to the  
unemployment episode);
- OCCUP = 1 if white collar occupation, 0 otherwise;
- UNIONIZE = 1 if union member, 0 otherwise;
- FLXWAGE = 1 if willing to accept wages lower than at the  
previous job, 0 otherwise;
- FLXINDUS = 1 if also searched for a job in industries in  
addition to the previous, 0 otherwise;
- FLXOCCUP = 1 if also searched for a job in occupations in  
addition to the previous, 0 otherwise;
- LOOKBLLJ = 1 if looked for alternative job while still  
employed, 0 otherwise;
- URATE = provincial unemployment rate at the start of the  
search period;
- LOCATION = a set of six provincial dummy variables; British  
Columbia is the category omitted from  
regressions;

LOCPRE1 = Newfoundland;  
LOCPRE2 = New Brunswick;  
LOCPRE3 = Quebec;  
LOCPRE4 = Ontario;  
LOCPRE5 = Manitoba;  
log T = the logarithm of actual tenure at the next job  
(T = actual tenure at the next job);  
SPOUSEY = 1 if spouse had an employment income,  
0 otherwise;  
OTHERY = 1 if had other sources of income during  
unemployment, 0 otherwise;  
SAVINGS = 1 if used savings during unemployment,  
0 otherwise;  
UIB = 1 if received unemployment compensation while  
unemployed, 0 otherwise;  
PRIMEARN = 1 if prime earner of the family,  
0 otherwise;  
DEPENDENT = number of dependents divided by the number  
of earners in the family;  
MARITAL = 1 if married, 0 otherwise;  
log  $W_{t-1}$  = logarithm of real (in 1971)  
dollars) pre-unemployment weekly wages;  
 $D_t$  = duration of search in period t in weeks.



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