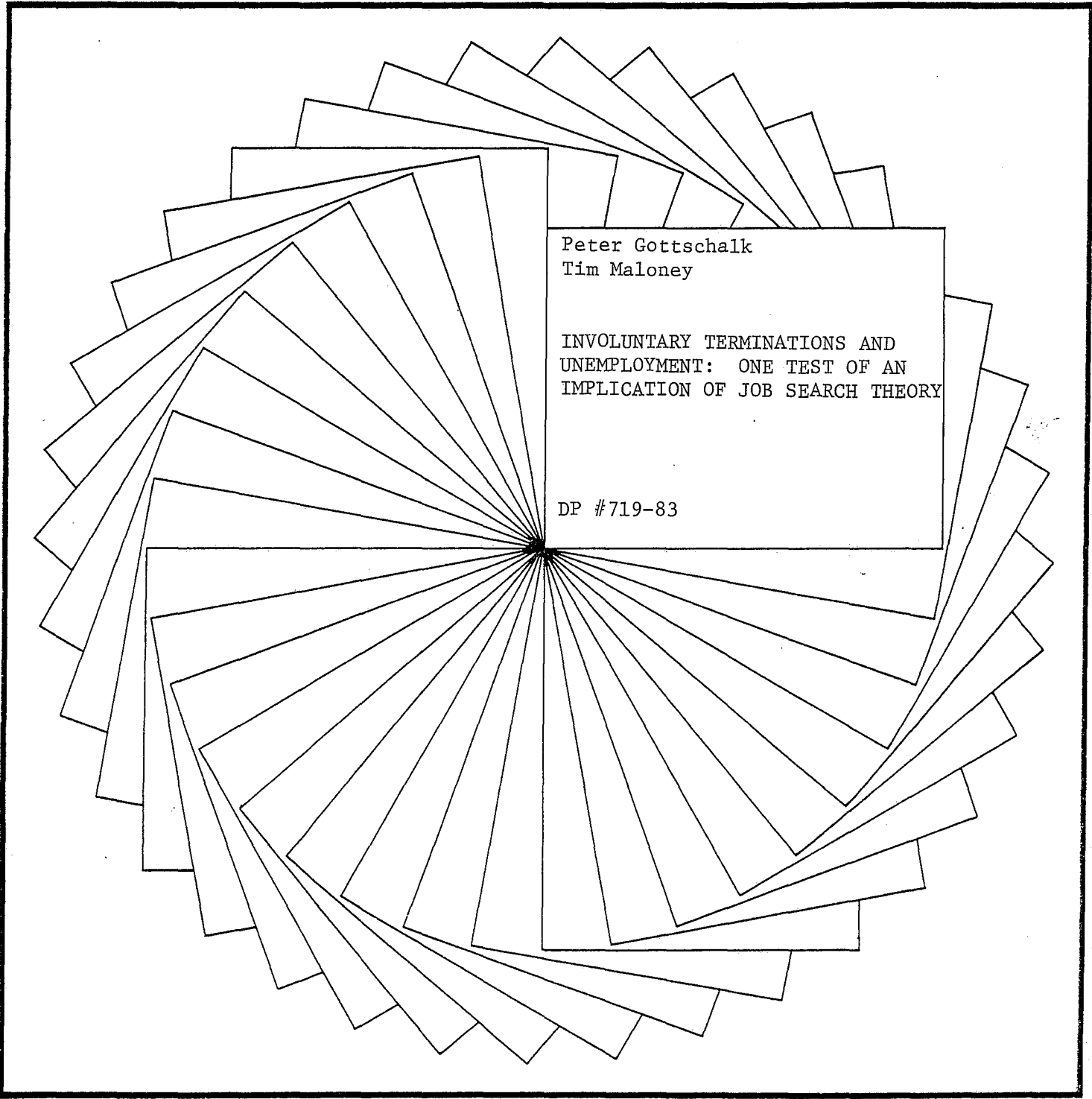

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INVOLUNTARY TERMINATIONS AND
UNEMPLOYMENT: ONE TEST OF AN
IMPLICATION OF JOB SEARCH THEORY

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Involuntary Terminations and Unemployment: One
Test of an Implication of Job Search Theory

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ABSTRACT

Is it meaningful to talk about workers being involuntarily terminated or involuntarily unemployed? The Keynesian answer is clearly "yes." However, two recent developments in labor market analysis suggest that the Keynesian analysis may be misleading. First, search theory characterizes unemployment as a form of voluntary investment in job search. Second, some authors argue that the distinction between voluntary and involuntary terminations may not be meaningful. A termination results when the employee/employer match is unacceptable to either party. It is irrelevant to ask who ultimately severs the employment relationship.

This paper directly tests these two interrelated hypotheses. An act is defined as being involuntary if it lowers the probability that the person will be better off in the new job when compared to the old job. An analytical framework is developed which integrates the key concepts of job shopping and job search models. The model predicts that unemployment has no effect on the probability of being better off if one controls for the type of termination. However, involuntary terminations worsen the prospects of a successful job change, even if the person is given prior notification.

The predictions of the theory are tested using the Michigan Panel Study of Income Dynamics. Bivariate probit models are estimated to correct for possible selection bias. The empirical results are consistent with the theory. Those who were involuntarily terminated had a lower probability of responding that they were better off in their new jobs than those who were not involuntarily terminated. However, after

controlling for the type of termination, we find that experiencing a spell of unemployment had no impact on the probability of a successful job switch.

We conclude that it is important to make a distinction between involuntary terminations and unemployment. These are conceptually separate phenomena, but they are often experienced simultaneously by the same person. It is, however, the involuntary termination, not the experience of the unemployment, which lowers the probability of a successful job change.

Involuntary Terminations and Unemployment: One
Test of an Implication of Job Search Theory

One of the more controversial conclusions of job search theory is that unemployment reflects voluntary search activity. The unemployed rationally extend their duration of unemployment by not accepting a wage offer if the expected benefit of waiting for a higher offer outweighs the expected cost. The theory predicts that, in this limited sense, unemployment is voluntary.

While an extensive empirical literature has developed around search theory, no study has focused directly on this controversial prediction. This paper attempts to fill that gap. It is divided into three parts. The first section presents our work in the context of previous studies in this area. The second section develops an analytical model which underlies our empirical work; central to the model is the interrelationship between job terminations and unemployment. The final section contains our empirical results and summarizes our findings.

I. INTRODUCTION

In the 1970s a steadily growing stream of articles, based on Stigler's (1961) pioneering work, argued that what had been taken as involuntary unemployment by Keynesians was in fact voluntary search activity.¹ The unemployed were not experiencing unusual hardship. They were optimally searching for employment opportunities in order to maximize their discounted future streams of income.

Search theory received, at best, lukewarm support by even non-dogmatic Keynesians. As Robert Solow (1980) stated in his 1979 Presidential Address to the American Economic Association, the theory seemed to have little connection to commonly perceived reality.

I believe that what looks like involuntary unemployment is involuntary unemployment A reasonable theory of economic policy ought to be based on a reasonable theory of economic life.

Keynesians argued that the implication of search theory that unemployment is voluntary might be applicable to persons who quit, but not to those who were fired or otherwise involuntarily terminated from their jobs.

The distinction between voluntary and involuntary terminations was, however, not acceptable to many economists working within a Walrasian framework. For example, Becker, Landes and Michael (1977) and Borjas and Rosen (1980) argued that as long as wages are flexible the involuntarily terminated person does not experience more hardship than someone who quits. Any termination indicates that a mutually satisfactory agreement could not be reached between an employee and employer. Knowing whether the person was fired or quit adds no new information. All that is known is who finally terminated the dialogue once a mutually advantageous agreement could not be reached.

A conceptual basis for the distinction between voluntary and involuntary terminations is offered by Hashimoto and Yu (1980), who build upon the foundations laid out in Williamson, Wachter, and Harris (1975). Hashimoto and Yu accept the conclusions of Becker et al. that the distinction between voluntary and involuntary termination is meaningless if wages are flexible. However, optimizing behavior may lead to fixed

wages if human capital is firm-specific. Hashimoto and Yu show how fixed wages (or wages which vary with imperfect proxies for productivity) can lead to quits or layoffs even when the current employment relationship offers positive net benefits (i.e., rents) which could be shared by the employee and employer. The fixed wage does not allow these rents to be redistributed ex post to maintain the employment relationship. A person may be involuntarily terminated, in the sense that the current job would still offer a wage higher than the wage in the next best job, if recontracting were allowed. Since it is not allowed (to avoid opportunistic behavior), the person is let go when productivity falls below the fixed wages.

Whether it is meaningful to talk about terminations as being voluntary or involuntary is, therefore, an empirical question. If wages are flexible, then separations will only occur when rents are negative and it is irrelevant to ask who terminates the employment relationship. However, if wages are fixed, then some people may be laid off and face the prospect of accepting jobs with lower expected wages.

We believe that three factors have contributed to the lack of consensus over whether unemployment and/or terminations are involuntary. Our analysis tries to deal with these factors.

First, conflicting definitions of involuntary unemployment have often been used by proponents and opponents of each theory. The definitions often lead to tautological conclusions. For example, if all optimizing decisions are defined to be voluntary then, by definition, search unemployment is voluntary since it is derived from an optimizing model.² The problem having been defined away, no empirical evidence can

be brought to bear. Similarly, if a person is defined as being involuntarily unemployed when that individual would prefer to secure an acceptable job rather than to continue to search, then unemployment is involuntary by definition. Again there is no room for debate since the conclusion is tautological. If a consensus is to be reached it is essential that verification of the theory be based on testable predictions.

The second factor contributing to lack of agreement is that the empirical work has shed only indirect light on the question of whether or not unemployment is voluntary.³ As Lippman and McCall (1976b) and Kiefer and Neuman (1979) point out, most studies have only weak theoretical links or indirectly test the theory by focusing on other predictions.

Third, previous studies have not clearly separated predictions of search theory from the conceptually separate issue of whether or not terminations are involuntary. As we will show, many people who were unemployed did not report that they were involuntarily terminated and many people who reported they were involuntarily terminated did not experience unemployment. A clear test of search theory's prediction that unemployment is a form of voluntary investment should, therefore, control for the type of termination. If the type of termination is irrelevant, then such controls are superfluous. If the distinction between voluntary and involuntary terminations is meaningful then ignoring the type of termination may lead to biased estimates.

Before we develop our model, it is important to stress that we are focusing on who bears economic hardship, not on the aggregate amount of hardship. The usual analogy with musical chairs is appropriate. We are

concerned with who remains standing, not on the number of chairs. The static model applied to musical chairs would predict that persons might voluntarily pass up the opportunity to sit in some chairs, if prizes were given according to the chair the person occupied in each period. Accepting that search determines who is unemployed does not necessarily imply that search determines how many people are unemployed, or whether changes in macroeconomic conditions alter the number of people experiencing hardship.⁴ Our results have nothing to say about whether changes in aggregate unemployment are a result of money illusion, as in the Friedman-Phillips model, or of changes in aggregate demand with wage rigidity. Proponents of either of these macro theories can accept our results without undermining their position on the dynamics of unemployment.

II. CONCEPTUAL MODEL

Overview. Our approach is to develop a search model which incorporates the distinction between voluntary and involuntary terminations. Whether this distinction is quantitatively important is an empirical matter which is tested in the next section of our paper. Our definition of involuntary focuses on the expected result of search. A sufficient condition for a spell of unemployment to be involuntary is that it increases the probability that the person will be worse off in the new job when compared to the previous job.⁵ No rational, risk-neutral or risk-averse person would become unemployed voluntarily if the expected

outcome was worse than the previous job. This definition yields testable predictions.

The model focuses on four conceptually different steps which are taken in changing jobs. First, the person is either voluntarily or involuntarily terminated. Second, the person who decides to quit or who is involuntarily terminated with prior notification chooses the method of search. He or she can search on-the-job, by looking for work while continuing in the current job, or by engaging in full-time search (i.e., by becoming unemployed). Third, the person decides whether to accept each job offer as it is received or whether to continue searching for a better offer. The fourth step occurs after the person has evaluated the "experience-good" aspects of the job.⁶ At that point he or she can determine whether the new job is better than the previous job. The question we ask is whether the type of termination and/or the experience of unemployment affects the probability that the person will find the new job better than the previous job.

Throughout we use a simple random search model with an infinite time horizon on the new job, no discounting, risk neutrality, and no recall. The usual complexities would be introduced by relaxing these assumptions. We are unaware of any new insights that would be added to our study by relaxing these assumptions. This model is a straightforward extension of search theory to take account of the possibility that persons may be given notification that they will be terminated at the end of a finite number of periods.

Notation. Consistent with the literature on sorting models⁷ we take account of the experience-good aspects of a job by distinguishing between

ex ante and ex post wages. Offers of ex ante wages, W , are drawn from a distribution with a cumulative density function $F(W)$. These offers incorporate all the known information about the job at the time the offer is accepted or rejected.⁸ Once on the new job, the experience-good characteristics of that job are observed. The ex post wage is given by

$$(1) \quad W^* = W + V \qquad E(V) = \text{cov}(W, V) = 0$$

where V represents the value of the characteristics which can only be observed on the job.

The cost of search depends on the method of search being used.⁹ Let C_o and C_f be the respective costs of on-the-job search and full-time search for one period. Since no wages are earned while unemployed, the cost of full-time search includes the earnings that could have been received during the period (i.e., the earnings in the previous job) plus any out-of-pocket expenses, minus any unemployment insurance benefits.

The length of the time period is defined so that one offer is received each period if the person searches full-time. If the person searches on the job, the probability of receiving an offer is lowered to q per period ($q < 1$). The cost of generating an offer while searching on the job is, therefore, C_o/q .

Voluntary terminations. We start by considering the simplest case in which the person may continue to work indefinitely on the job paying W_1^* , or may decide to search for a new job. A reservation wage is set to equate the expected marginal benefit and the marginal cost of search. Since the person has two search methods, each with a different cost, two reservation wages are determined: one for the on-the-job search (R_o) and

the other for full-time search (R_f). It is well known that these reservation wages satisfy the following conditions:

$$C_f = \int_{R_f}^{\infty} (W - R_f) f(W)dw$$

$$C_o/q = \int_{R_o}^{\infty} (W - R_o) f(W)dw$$

It is easily shown that the person will choose the method of search with the lower cost of search, and hence the higher reservation wage, since it has the highest expected return:

$$E \max(R_o, W) > E \max(R_f, W) \text{ iff } C_o/q < C_f$$

where, in general, $E \max(\cdot)$ is defined as

$$E \max(R, W) \equiv R \int_0^R f(x)dx + \int_R^{\infty} x f(x)dx.$$

Since the method of search chosen has a higher reservation wage, it will also have a higher probability that the ex post wage in the new job will be higher than the ex post wage in the previous job.

Hence, search theory predicts that, for people who quit their jobs, lower cost search methods will be associated with higher probabilities of being better off in the new job. Some people choose to become unemployed because this is their lower cost method of search. Ceteris paribus, they will have a higher probability of being better off than if they had searched on the job. Similarly, those who choose to search on the job

find this type of search relatively inexpensive. Hence, for them, on-the-job search leads to a higher probability of making a successful job change than if they had used full-time search. Therefore, the theory predicts that for people who quit there will be no relationship between unemployment and the probability of being better off in the new job.

Involuntary terminations. Whether a person who is involuntarily terminated has a lower probability of being better off in the new job than a person who is not involuntarily terminated depends on the length of the notification period. This is seen most clearly for two extreme cases. First, individuals who are given no notification have two fewer options than individuals who are not terminated. Since they can neither stay permanently on their previous job, nor engage in on-the-job search, they have a lower probability of being better off in their new job than someone who is not involuntarily terminated. At the other extreme, a person who is given an infinitely long notification period can choose either method of search, and consequently is in the same situation as someone who may decide to quit.

A person with a finite notification period must take into account the possibility that he will not receive an acceptable offer by the expiration of the notification period. If the cost of searching on-the-job is lower than the cost of full-time search, then the person faces an increase in the cost of search after a finite number of draws. As the period of on-the-job search for involuntary terminees becomes shorter, the reservation wage drops, and the probability that the ex post wage in the new job will be above the wage in the old job also drops.¹⁰ Therefore, there are theoretical reasons, all consistent with a job

search framework, to believe that some terminations are involuntary, in the sense that they lower the expected outcome of the search process.

III. VERIFICATION OF THE THEORY

Introduction. Two problems are immediately confronted in attempting to verify the predictions of the theory. First, the job sorting aspects of the model assume that people place value on unobserved characteristics of the job that are not known with certainty when the person accepts the job. It is, therefore, important that our measure of compensation include non-monetary aspects.¹¹ This problem is partially overcome by using the Michigan Panel Study of Income Dynamics (PSID). Persons who change jobs are asked the specific question: "On the whole, would you say your present job is better or worse than the one you had before?" This broad question allows many people to answer that they were better off even though their money wage rates may have fallen.¹²

The second problem is that the sample of people who were asked whether they were better off in their new job is not a random sample of the population. In order to be asked the question the person must have left the old job and have completed any spell of unemployment undertaken while changing jobs. This introduces the possibility of selection bias.

To clarify the source of the selection bias, consider the usual latent variable framework in which there is both a selection equation and primary equation.¹³ The selection equation determines whether the person is in the sample and the primary equation determines whether the person is better off. A latent variable Y_1 is a linear function of a vector of characteristics X_1 and a random component ϵ_1 . If this latent variable

exceeds the threshold C_1 , a dichotomous variable Y_1^* is set equal to one. This signifies that the person is included in the sample. Similarly, a vector of characteristics X_2 and a random component ε_2 determines whether the dichotomous variable in the primary equation Y_2^* takes on the value of 0 or 1.

$$Y_1^* = 1 \quad \text{if } X_1\beta_1 + \varepsilon_1 > C_1$$

$$= 0 \quad \text{otherwise}$$

$$Y_2^* = 1 \quad \text{if } X_2\beta_2 + \varepsilon_2 > C_2$$

$$= 0 \quad \text{otherwise}$$

which yields

$$\Pr(Y_1^* = 1) = \Pr(\varepsilon_1 > C_1 - X_1\beta_1) \quad \text{selection equation}$$

$$\Pr(Y_2^* = 1) = \Pr(\varepsilon_2 > C_2 - X_2\beta_2) \quad \text{primary equation}$$

If ε_1 and ε_2 are independent, then the selection and primary equation can be estimated separately. If they are not independent, the two equations must be estimated jointly. Our approach is to estimate the two equations simultaneously, using maximum likelihood, and to test for independence.

Selection bias is at least a potential problem since unmeasured factors which affect selection may be correlated with unmeasured factors which affect the probability that the person is better off. For example, we can only observe people who complete their search spells. We may, therefore, be oversampling people with low reservation wages, who are less likely to experience an increase in their well-being after job search.

Our procedure is to estimate bivariate probit equations using the sample of all people who left the job they held in the initial year of our survey period. The selection equation predicts whether they completed their search by the end of the period. The primary equation predicts whether the person was better off in their new job.

It should be borne in mind that the estimation does not take into account the prior selection which determines whether the person moved. The results analyze the impact of observed characteristics on the behavior of someone who moved, rather than on the behavior of a randomly selected individual.¹⁴ We believe that this is the proper sample to study the hypothesis that those who were unemployed were voluntarily unemployed.

Data. The PSID was used to obtain a sample of male household heads who were observed in 1978 and 1979. This relatively recent period was chosen because it is the latest period which did not include a major recession.

To be included in the sample the head had to be between 23 and 61 years old in 1979 and must have been neither self-employed nor a farmer in either 1978 or 1979. Of this sample of 2,657 non-aged males, 2,173 held the same job in both years and 413 had a different job in the second year. The remaining 71 were unemployed at the time of the 1979 interview.

Descriptive statistics. Table 1 shows the mean characteristics of the sample, broken down according to status in 1979. Consistent with other studies, our sample shows that people who changed jobs had below average tenure in their previous jobs¹⁵ and tended to be somewhat younger

Table 1

Mean Characteristics of Sample by Status in 1979

	Full Sample	1979 Status			Unemployed
		Same Job	Different Job		
			Better Off	Worse Off	
Age	37.6	38.6	32.1	35.2	32.9
Education	12.1	12.1	12.5	11.3	11.2
Tenure Last Job (months)	69.1	77.2	31.6	43.7	25.7
Percent Nonwhite	34.9	34.2	30.4	42.9	66.1
N	2657	2173	322	91	71

Table 2

Distribution of Movers by Type of Termination
and Unemployment Status
(N = 484)

Type of Termination	All Movers	Experienced Unemployment	
		Yes	No
Voluntary	.708	.264	.444
Involuntary	.291	.221	.070
All Types	1.00	.485	.514

than persons who did not move. Nonwhites had a somewhat higher probability of changing jobs and were more likely to be unemployed at the end of the survey.

Table 2 shows the distribution of people who changed jobs according to the type of termination they reported and whether they experienced unemployment.¹⁶ Three facts stand out from this table. First, involuntary terminations constitute a substantial proportion of terminations. Almost a third of the movers report they were involuntarily terminated. This is consistent with aggregate time series on quits and layoffs. Second, a considerable amount of search occurred on-the-job for people who quit.¹⁷ Over two-thirds of the men who quit never experienced unemployment. Third, the data indicate that involuntary terminations do not always result in unemployment. The fact that 24 percent of the people involuntarily terminated never experienced unemployment indicates that formal or informal notification was given in a large number of cases. The notification was sufficiently long to allow many of the men to line up new jobs before they had to leave their old jobs.

Table 3 examines how people who had concluded their job search by the end of the survey period answered the question, "On the whole, would you say your present job is better or worse than the one you had before?"¹⁸ More than 78% of the sample answered that they were better off. This confirms the view held by Rosen (1972) and others that job changes are an important method of improving one's economic well-being.

Looking at those who are cross-classified according to the type of termination and whether or not they experienced unemployment indicates that both unemployment and involuntary terminations reduced the probabi-

Table 3

Percentage Reporting Themselves Better Off in Their New Jobs
by Type of Termination and Unemployment Status
(N = 413)

Type of Termination	All Movers	Experienced Unemployment	
		Yes	No
Voluntary	.829	.809	.837
Involuntary	.642	.613	.706
All Types	.780	.720	.819

lity that the person would report that he was better off in the new job than in the old job. At this stage, the evidence does not seem to be consistent with the prediction of search theory that unemployment has no impact on the outcome of search. In order to test whether these conclusions hold up after controlling for other determinants, we turn to some estimated models.

Bivariate Probit

Table 4 shows the results of estimating two sets of bivariate probit equations, using observations on the 484 non-aged men who left their jobs in 1978. Each set of bivariate probit equations consists of a selection equation, which predicts the probability that the person had found new employment by the time of the 1979 interview, and a primary equation, which predicts the probability that the person was better off in his new job.

Equations 1 and 2 of Table 4 present our basic finding. The significant value of ρ indicates that estimating the selection and primary equations separately would have been inappropriate since the error terms are correlated across equations.

Column 1 shows the factors affecting the probability that the person found a job by the end of the survey. This selection equation was estimated over the 484 people who moved. Men with long tenure in their previous jobs, those who were married and whites had a significantly higher probability of not experiencing unemployment or of having completed their spell of unemployment by the end of the survey period.

Table 4

Biprobit Estimates With and Without Involuntary Termination
(standard errors in parentheses)

	(1) Pr(Complete Move)	(2) Pr(Better Off Move and Complete)	(3) Pr(Complete Move)	(4) Pr(Better Off Move and Complete)
Constant	1.212*** (.632)	1.526*** (.552)	.767* (.584)	1.266*** (.536)
Education	.155 (.312)	.253 (.292)	.325 (.295)	.381 (.311)
Race	-.639*** (.168)	-.083 (.157)	-.631*** (.165)	-.085 (.165)
Tenure	.455** (.223)	-.189 (.156)	.358* (.220)	-.212* (.157)
Age	-.099 (.095)	-.159** (.095)	-.065 (.092)	-.145* (.100)
Married	.428*** (.165)	-.187 (.175)	.439*** (.164)	-.166 (.181)
Involuntarily Terminated	-.441*** (.167)	-.357** (.168)	-- --	-- --
Unemployed	-- --	-.109 (.150)	-- --	-.258** (.143)
N	484	413	484	413
Rho		-.871** (.449)		-.796 (.909)
Log Likelihood		-380.1		-388.3

***significant at 1% level for 2-tailed test

**significant at 5% level for 2-tailed test

*significant at 10% level for 2-tailed test

Persons involuntarily terminated, however, were less likely to have completed their spells. This is the result of two offsetting factors. The theory suggests that those who were involuntarily terminated were more likely to have a spell of unemployment, and were thus more likely to be unemployed at the time of the 1979 interview. However, the theory also predicts that people who were involuntarily terminated revised their reservation wages downward as they neared the end of the notification period. This would tend to decrease the probability that they did not complete their spell. The evidence indicates that the latter was not sufficiently strong to offset the former.

Column 2 shows the results of using the 413 people who found new jobs to predict the probability that they reported themselves better off after the job change. This equation offers a direct test of the hypothesis that, after controlling for the type of termination, unemployment does not lower the probability of a successful job search.

Being involuntarily terminated significantly decreased the probability that the person reported himself better off in the new job. This is consistent with the variant of search theory developed in this paper. Involuntary terminations led some people to revise their reservation wages downward as the notification period came to a close. This led to a significant decrease in the probability that the person was better off in their new job.

However, after controlling for the type of termination, unemployment did not have a significant impact on the probability that the person reported that he was better off in his new job.¹⁹ This is consistent with the theory that the type of search does not affect the probability

of being better off. Lower cost methods of search are chosen and they lead to higher probabilities of successful job matches than high cost methods of search. In this sense, being unemployed is a voluntary decision.

The bivariate probit equations shown in columns 3 and 4 point to the importance of controlling for the type of termination. When the involuntary termination dummy is dropped from the equation, unemployment becomes significant. This would lead to the erroneous conclusion that being unemployed significantly decreased the probability of being better off in the new job. The theoretical framework developed earlier identifies the source of bias from excluding the type of termination. Being involuntarily terminated increases the probability of being unemployed and decreases the probability of being better off. The omitted variable in column 4 is, therefore, correlated with a key included variable.

SUMMARY

We believe we have shown that search theory is correct in predicting that those who are unemployed are as likely to make a successful transition to a better job as those who search on-the-job. On the other hand, our evidence indicates that attaching the adjective involuntary to certain types of terminations is meaningful.

The distinction between involuntary terminations and unemployment is important. These are conceptually separate phenomena, but they are often experienced simultaneously by the same person. Many of the unemployed were also involuntarily terminated. However, it is involun-

tary termination, and not the experience of unemployment, which reduces the probability that a successful job transition will be made.

NOTES

¹See Lippman and McCall (1976a) for a review of the theoretical literature.

²Even coerced decisions can be viewed as voluntary under this definition, since they are the result of optimizing under a new set of constraints--a person prefers giving up his wallet to being mugged.

³See Lippman and McCall (1976b) for a review of the early literature. See Burdett (1978) for more recent tests of the theory.

⁴Lippman and McCall (1976c) argue that since the simple search model assumes that the wage distribution is static, it is misused in trying to explain the dynamics of employment.

⁵A necessary condition for unemployment to be involuntary would be if it increases the probability of being worse off in the new job after taking into account the expected cost of search in making the transition. Using this definition would not alter any of our results but would lead to predictions which were not testable, since we know of no data set which asks whether the person was better off after taking account of the cost of obtaining the new job.

⁶See Nelson (1974) for an early use of this concept and Flinn (1982) for examples of applications to labor mobility.

⁷See Flinn (1982) for a review of the job sorting literature.

⁸All wage concepts used in this paper should be viewed as the monetary equivalent of the present discounted value of future pecuniary and non-pecuniary benefits in that job.

⁹We assume that persons draw from the same distribution whether they search on-the-job or full-time.

¹⁰This result, which is intuitively obvious, can easily be proved by assuming that each wage offer is compared with the expected net benefit of future search. As the notification period becomes shorter, the expected cost of search rises as the probability attached to the (higher) cost of full-time search increases. The proof is available from the authors.

Note that this model offers an alternative explanation for reservation wages declining with time. Other models have relied on lack of full information about the earnings distribution leading to revision of the reservation wage as persons gain more information.

¹¹Bartel and Borjas (1981) examine the impact of the type of termination on wage growth. Their model is unable to explain why a substantial number of people quit to move to jobs with lower wages.

¹²For the importance of non-wage job characteristics, see Bartel (1982). Of those in our sample who reported that they were "better off," 41% actually had lower real wage rates than in their previous job.

¹³See Amemiya (1974), Ashford and Sowden (1976), and Tunali (1982) for a more complete explanation of this problem.

¹⁴A model to predict the impact on a random individual would include three selection equations--whether the person quit, whether the person was involuntarily terminated, and whether the person completed the search spell--as well as one primary equation, which would explain whether the person was better off. This system would be prohibitively expensive to estimate even if the computer software were available.

¹⁵Tenure is the number of months that the individual held his current job at the time of the 1978 interview. Individuals over the age of 45 did not answer this question. For these people, tenure was taken from the

1977 interview and 12 months were added to this variable. Those who were unemployed at the time of the 1977 interview were assumed to have had 6 months of tenure by the time of the 1978 interview.

¹⁶Terminations are classified as being involuntary if the individual reported that he had lost his job in the last year because either the employer went out of business, or the individual was fired or permanently laid off. Separating plant closings from layoffs does not alter our results. The unemployment variable indicates an unemployment spell over the last year. While it would have been preferable to classify people according to whether they experienced unemployment between jobs, these data are not available.

¹⁷See Mattila (1974) for confirming evidence.

¹⁸The answer to this question is far from perfect since people may misreport their change in status. People who were fired may be particularly critical of their old job and people who voluntarily quit may overrate their new job rather than admit that, in retrospect, they should not have quit. However, by including non-monetary aspects of the job this question comes closest to capturing the key elements laid out in Section I of this paper.

¹⁹See Borjas and Bartel (1981) for confirming evidence. Though they do not discuss the relationship between unemployment and wage growth between jobs, their reported results show insignificant coefficients on unemployment.

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