AN EMPIRICAL ANALYSIS OF THE RELATION

BETWEEN PERSONAL ATTRIBUTES AND

THE DURATION OF UNEMPLOYMENT

By

JAMES NYE MANGUM

Bachelor of Arts
North Texas State University
Denton, Texas
1959

Master of Arts
North Texas State University
Denton, Texas
1965

Submitted to the Faculty of the Graduate College
of the Oklahoma State University
in partial fulfillment of the requirements
for the Degree of
DOCTOR OF PHILOSOPHY
May, 1973

AN EMPIRICAL ANALYSIS OF THE RELATION

BETWEEN PERSONAL ATTRIBUTES AND

THE DURATION OF UNEMPLOYMENT

Thesis Approved:

_____
Thesis Adviser

_____

_____

_____

_____
Dean of the Graduate College

ii

PREFACE

Some job seekers experience longer periods of unemployment than others. The primary purpose of this dissertation is to estimate the relation between selected personal characteristics and the duration of unemployment. The study is especially concerned with identifying those personal attributes that are associated with relatively longer periods of job search.

The basic empirical technique is least squares multiple regression analysis. Most of the available information that relates the duration of unemployment to personal factors is in two- or three-way cross tabulation form. It is believed that regression analysis is a more accurate way of determining the relation between the duration of unemployment and the factors of interest.

The sample is composed of a group of unemployment insurance recipients who became unemployed in Brooklyn, New York, between August 28, 1967, and January, 1969. I am very grateful to the New York State Department of Labor and Industry for making the data available.

I also wish to acknowledge my sincere gratitude to the many individuals whose assistance and cooperation made this study possible. I am especially thankful to Dr. Joseph J. Klos for his efforts and advice in directing the study. Dr. Klos has at all times been willing to offer his assistance in solving the problems that arose.

Appreciation is also expressed to Dr. Rudolph W. Trenton for his contributions to the dissertation and for his assistance throughout my entire period of study at Oklahoma State University.

I am thankful to Dr. R. Franzman for his advice and contributions to the dissertation.

I am thankful to Dr. Gerald M. Lage for his advice regarding the statistical analysis.

A sincere acknowledgment of gratitude is expressed to Dr. David W. Stevens, my former thesis advisor, for his initial help in developing the theoretical framework presented in Chapter II. Dr. Stevens was also instrumental in acquiring the data for this study.

Last, I would like to express my deep appreciation to my wife, Sylvia, and children, Caroline and Jeff, for their encouragement and patience during the course of this study.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ILLUSTRATIONS

CHAPTER I

INTRODUCTION

The duration of unemployment varies among individuals. A given unemployed individual's probability of finding a job within a given time span is affected by such factors as education, age, race and industrial attachment. Professional students of labor market processes lack an understanding of these correlates of unemployment duration. Such an understanding could have broad and important policy implications.

Consider the following statement by Suits and Morgenstern:

> ...an annual unemployment rate of four percent representing 100 million idle man-weeks may be the result of 25 million men experiencing an average of two spells of unemployment per year with an average duration per spell of two weeks. The same 100 million man-weeks of unemployment, however, may be the result of 5 million men, again with an average of two spells of unemployment per year..., but with an average duration of 10 weeks per spell.[1]

The first situation--many persons experiencing short spells of unemployment--indicates a frictional problem. The latter--few persons experiencing long spells of unemployment--implies a problem of limited job opportunities. Even though the jobless rate is the same in both cases, the policy and welfare implications are clearly different.[2]

---

[1]Daniel B. Suits and Richard D. Morgenstern, "Duration as a Dimension of Unemployment" (unpub. paper, University of Michagan, 1967), p. 1.

[2]Ibid.

In view of the above, the assertion is made that the duration of unemployment rather than the rate is a more appropriate means of identifying those jobless participants that experience the greatest difficulty in finding work. This can be further clarified by actual examples.

The rate of unemployment is relatively low among older workers, yet many such workers that do lose their jobs are apparently faced with severe obstacles to re-employment. Data for recent years indicate that the rate of unemployment for males over 45 is consistently below the national average. For January, 1968, the jobless rate for the over 45 group was approximately 2.7% as compared to a rate of 3.5% for all male workers. Yet 25.5% of the older participants had been unemployed for over 15 weeks while only 16.2% of the other group had been unemployed for the same length of time.[3]

The construction industry exemplifies an opposite duration-rate relation. Due to the highly frictional nature of the industry the rate of unemployment among construction workers is consistently higher than for the labor force as a whole. In January, 1968, the jobless rate for the entire industry was 13.4% as compared to 4.0% for the aggregate work force. On the other hand, the percentage of construction workers unemployed for over 15 weeks was only 11.1% as compared to 18% for the entire work force.[4]

Information relating the duration of unemployment to personal factors at an assumed constant level of economic activity has long

---

[3]U.S. Department of Labor, Bureau of Labor Statistics, February 1969, p. 80.

[4]Ibid.

been available in two or three-way cross tabulation form. However, since this presentation format allows us to observe only the simple association between factors, the key question for policy decisions remains: Is the observed relation in this simple two or three-way array an accurate representation of the actual underlying relation between factors of interest, especially when other associated factors are considered? The relevance of this question stems largely from the fact that many factors presumed to limit job opportunities are strongly interrelated. For instance, it is well known that the incidence of low education and skill status is concentrated disproportionately among certain age groups—older and very young workers—and minority groups.

Purpose

The main purpose of this thesis is to estimate the relation between selected personal characteristics and the duration of unemployment. The analysis is based on data for several thousand unemployment recipients who received benefits through a single Brooklyn, New York unemployment insurance office between August 28, 1967, and January 3, 1969. The results of this analysis will be interpreted with particular attention being given to their relevance for other urban labor markets.

This study cannot attempt to estimate the relation between changes in the level of economic activity and the duration of unemployment. Specific dates as to when each participant became unemployed are not on record. Such an undertaking would not in any case appear especially fruitful since there was little variation in the aggregate level of economic activity for the period under study.

Hypotheses

1. Some personal factors--specifically younger and older age categories, and minority status--will be found to be positively related to unemployment duration.

2. Other personal factors--educational attainment and skill level--will be found to be negatively related to unemployment duration.

Some dimensions of the effect of local labor market conditions on duration will be indirectly taken into account. This will be done by estimating the relation between the duration of unemployment and the individual's industrial classification. The usefulness of such information for the purpose of generalizing from one area to the other will, of course, vary according to the degree of similarity between the labor markets under consideration. In any case, however, such should allow us to clarify with more certainty the "real" relation between personal attributes and duration for the group under study.

Methodology

It is emphasized that the above factors would appear to affect duration of unemployment vis-a-vis the array of jobs open to an individual. By the use of least-squares regression techniques, this study will attempt to more satisfactorily estimate the "true" relation between such factors and unemployment duration.

Because of the nature of the data, the measure of duration will extend only over the period from the time an unemployment insurance claimant first becomes unemployed until he finds a job or exhausts his employment insurance benefits. Thus, the relevant time-frame

is a single spell of unemployment, and this is truncated for those who exhaust their eligibility for benefits.

<div align="center">Source of Data</div>

The data for this study are available as a result of the Claimant Advisory Service Program (hereafter referred to as CLASP) undertaken in a Brooklyn Unemployment Insurance Office from August 28, 1967, to January 3, 1969. The CLASP experiment was undertaken under the auspices of the New York State Labor Department for the purpose of "...improving the employability of the jobless worker..."[5] and in identifying workers who need supportive services.

More specifically, the employment prospects and problems of recently unemployed claimants were assessed by specially trained claims interviewers shortly after the claimant applied for benefits, whereafter each individual, dependent upon his particular needs and special problems, was placed in one of three groups within a test or control category.[6]

Group I was made up of persons who anticipated only temporary or seasonal unemployment and expected to return to work within a short period of time. This group received no special treatment except that the test claimants were not required to register with the Employment Services Office to receive their placement services.

---

[5]Edward M. Caine, "Improving Employability of UI Claimants," Unemployment Insurance Review, December, 1967, p. 1. For a similar brief description of the CLASP experiment, see this article, pp. 1-3.

[6]As indicated below, only the test personnel were given the special services or treatment herein described.

Group II consisted of those whom the Unemployment Insurance Office staff considered to have marketable skills but no immediate prospects of returning to work. These individuals were required to cooperate in establishing a well defined job-search plan with the assistance of claims interviewers.

Group III claimants were made up of those whose job prospects appeared particularly diminished by skill status, cultural reasons and other factors. Individuals in Group III test category received counseling and supportive services by the Employment Service.

To test the effectiveness of the CLASP system an equal number of claimants were initially classified into identical groups according to the above criteria, but received only the regular services of the Unemployment Insurance Office and the Employment Service. The claims period for each of these control groups and for the comparable experimental groups were subsequently compared through selected cross tabulations. No multiple regression analysis was, however, attempted.

Detailed information about personal characteristics and background was kept on each individual participating in the CLASP program. These data were compiled on data processing cards and have been provided to this person through the cooperation of the Research Section of the New York State Department of Labor and Industry.

The purpose of this thesis differs considerably from that of the CLASP project. For reasons to be explained in Chapter IV,

estimates of unemployment duration will be undertaken only for those in the control category.[7]

Format for Following Chapters

Chapter II will establish a theoretical framework for analyzing the variation in the duration of unemployment among labor force participants. The two fundamental premises of the chapter are that duration is affected by the participant's relative attractiveness to employers and by such factors as wage aspirations and job-search behavior.[8] The conceptual framework will rely substantially on previous contributions in the literature to this subject. Certain limitations of the study imposed by the data will be pointed out in the concluding section.

Chapter III will enumerate and discuss in detail the personal characteristics that we have hypothesized to affect duration. The discussion will emphasize the theoretical rationale for the selection of each factor. As mentioned earlier, the data seem quite adequate for testing the significance of these factors.

The actual statistical estimates of the correlates of duration begins in Chapter IV. The first section describes data editing procedures. At this point, a more detailed description of the CLASP project will be presented with special attention being given to the

---

[7]While test and control groups do appear homogeneous, it appears questionable that the subgroup classifications between test and control are comparable. This is explained in Chapter IV.

[8]On the one hand, participants with unattractive personal attributes should on the average experience a longer duration. On the other hand, the higher the acceptance wage—relative to qualifications—the shorter the expected duration should be.

manner in which the project was conducted. Next, all variables are introduced in the form in which they are to be tested. This is followed by a discussion of statistical techniques and a presentation of the statistical results. The last major section of Chapter IV will focus on an interpretive analysis of these results. Here, some inferences are made in regard to our findings for the relevance of aspirations and job search behavior to the variation in the duration of unemployment.

There are two major sections in Chapter V. The first consists of a statistical analysis of specific interaction terms and a discussion of the results. Second, more direct inferences are made concerning the aspiration-duration relation. This is done by using least squares multiple regression to estimate the relation between personal characteristics and the incidence or "probability" of becoming ineligible for unemployment insurance payments.[9] In this section, the possible relevance of these results for the duration estimates in Chapter IV will also be considered.

The last chapter is devoted to conclusions and a summary of major findings.

---

[9]The rationale for this approach will be clarified at the appropriate time.

CHAPTER II

THEORETICAL FRAMEWORK FOR ANALYSIS OF

DURATION OF UNEMPLOYMENT

Welfare Implications of Duration of Unemployment

Alchian notes that seeking work is a form of employment in
information production; that job information is sought, not jobs
per se, since jobs are always available.[1] While some may debate
that jobs are always available, clearly the expected duration of
unemployment could be reduced if every jobless individual was willing
and able to accept any job. However, Alchian continues, immediate
acceptance of a job would be efficient only if the cost of acquiring
additional information about alternatives were greater than the mar-
ginal returns from further search.[2]

Imperfect information would cause some persons to take jobs too
soon, or not soon enough. The point to be emphasized is that time
looking for work--unemployment--may yield net returns to both the
individual and to society.

---

[1]Armen A. Alchian, "Information Costs, Pricing and Resource
Allocation," Western Economic Journal, V, June, 1969, p. 111.

[2]Ibid.

Therefore, since at least some period of time spent looking for work is considered normal and even desirable, the <u>variation</u> in duration of unemployment among members of the labor force becomes meaningful for welfare considerations. If we can identify participants that typically experience a significantly longer period of unemployment than do others, corrective policy measures such as investment in human capital, in labor market information, or income transfers may be indicated.

The Queue Theory

One of the two basic propositions of this thesis is that the variation in the duration of unemployment is partially explicable by personal characteristics, and that at least some dimensions of this variability can be identified and used for policy purposes. The first part of this premise is a mere restatement of the well known queue theory that all job seekers are not equally endowed with the qualities sought by employers.[3] This concept of a labor force hierarchy leads us to expect--ceteris paribus--that whenever a group of individuals becomes unemployed at the same time those who rank higher on the continuum are likely to find work in a shorter period of time than those concentrated near the bottom. Such an approach presumes that the least attractive workers (as defined by personal attributes) have fewer employment opportunities than do others. The validity of this idea will be more fully explored later in the chapter.

----

[3]This chapter contains references to statements by prominent economists regarding the probable relevance of the queue theory to differential employment opportunities among job seekers. However, the writer has not been able to determine that the idea was originated by any single individual.

Much of the analysis regarding the queue theory has been based on the uneven impact of changes in the level of market activity upon employment opportunities. According to Thurow, employers are hypothesized to seek to hire from as far up the continuum as possible. But as aggregate demand expands, the pool of more desirable workers declines and the marginal employment gains among the disadvantaged become larger; i.e., because more of the better qualified workers are hired at higher levels of demand, the competitive position of the lesser qualified worker is enhanced. Much of the emphasis in this dynamic approach is on the impact of market activity on the availability of more preferred workers and the subsequent positive effect on employment opportunities for the less preferred workers.[4]

The cross-section approach that follows differs from such time series problems. It will become apparent as the discussion progresses that the duration of unemployment for a point in time with a given level of economic activity is _not_ related to _changes_ in the supply of more preferred workers. The emphasis is then upon competition for jobs at the given level of demand. Further consideration will be given to the level of demand at the appropriate time.

Before leaving this initial section on the queue theory, it seems appropriate to briefly discuss our reasons for using the single hierarchy approach as described by Thurow. As indicated above, the concept of a labor force hierarchy is nothing new to economists concerned

---

[4]The dynamic approach is described in more detail by Lester C. Thurow, _Poverty and Discrimination_ (Brookings Inst.: 1969), pp. 48, 49. Because of frictional unemployment, we do not say that _all_ workers in the former category are hired.

with the problems of unemployment for the so-called disadvantaged groups. It has, of course, long been recognized that the idea is a simplification of conditions as they actually exist since in reality the labor force is composed of many non-competing groups. For instance, within a narrow salary range, there exist occupational classifications that differ entirely in the kinds of skill and training required. On the other hand, within the same salary range, there will typically be degrees of similarity among many occupational groups and consequently gradations of competition among job seekers of these groups.

Similarly, there are hierarchies of skill requirements for jobs and skill levels among workmen within many broadly defined occupations, over a relatively wide salary range. However, it seems plausible to presume that a person with a given level of occupational skill would typically have the choice of accepting a job within the same occupation for which the skill requirements were lower. Moreover an unemployed person only marginally qualified for a given occupation should usually be able to find a job with even lower skill requisites in perhaps an entirely different line of work. The main idea that we wish to convey at this point is that there should be an array of jobs requiring different levels of competence from which a participant of a given job classification can seek employment. Thus, even though a theory of the labor supply in which there are many non-competing queues would be more representative of existing conditions, it is believed that the single hierarchy approach that is to be developed will serve the theoretical purpose of this chapter reasonably well.

Rational Search Behavior

Some additional comments seem called for regarding the relation between personal characteristics that define rank on the queue and variation in the duration of unemployment. Given the endowment of qualities a job seeker possesses, he may still have several options through which to alter his relative attractiveness within the labor force hierarchy.

For example, one's readiness to undergo training and/or enter a new occupation will increase the array of potential employment opportunities. Likewise, other types of flexibility, such as an expansion of the job search area (mobility) can often also increase the prospects for suitable job offers.

In addition, individual action may influence the chances of finding work in yet another very important way. Other things equal, the higher the threshold wage an individual is willing to accept, the smaller the chances of finding work in a given period. And, of course, he can expedite his chances of finding work, i.e., decrease the expected duration of unemployment, by lowering his acceptance wage.

Conditions that would seem to affect wage aspirations will be given detailed consideration at a later stage of this chapter. Factors that appear relevant to status within the labor force hierarchy will be discussed in a general manner in this chapter and will be discussed in detail in Chapter III. For the present, we will establish more fully a theoretical framework for relating both rank on the queue and wage aspirations to the variation in the duration of unemployment.

A Model

It is clear that finding an acceptable job is a rather difficult and time consuming search process. The complex random process of job seeking and finding arises from the non-standardization of jobs and workers and the lack of perfect knowledge. This accounts for the simultaneous existence of unemployed workers and job vacancies, a situation not contemplated in classical economic theory, in which there may be excess supply or excess demand but not both.[5]

Figure 1 shows a hypothetical interfacing of two continua that can be used to relate the location of a subgroup on the queue and the level of wage aspirations to the expected variation in the duration of unemployment. The continua have been artifically segmented.

The left column represents the range of jobs from the highest compensating to the lowest compensating. For simplicity, it is assumed that each job paying equivalent wages requires the same minimum qualifications and that the higher the level of compensation offered the more qualified the applicant must be. Once the wage rate is known, the minimum requirements for the job are known.[6] The term minimum qualifications as used here means simply that an applicant, if hired, must add to marginal product an amount that is equal to or greater than the wage rate. It does not mean that a qualified applicant will necessarily obtain the job.

---

[5]Charles C. Holt and Martin H. David, "The Concept of Job Vacancies in a Dynamic Theory of the Labor Market," The Measurement and Interpretation of Job Vacancies (New York, 1966), p. 95.

[6]The approach up to this point is very similar to that presented by Dale Mortenson, "Job Search, the Duration of Unemployment and the Phillips Curve," The American Economic Review, LX, December, 1970, pp. 847-862.

Figure 1

Labor Force Hierarchy

Hierarchy
of Jobs

Hierarchy of
Participants

st Compensating Jobs Y_5

X_5 Most Productive
Participants

Y_5 X_5

Y_4 X_4

Y_4 X_4

Y_3 X_3

Y_3 X_3

Y_2 X_2

Y_2 X_2

Y_1 X_1

Y_1 X_1

Y_0 X_0

Y_0 X_0

t Compensating Jobs

Least Productive
Participants
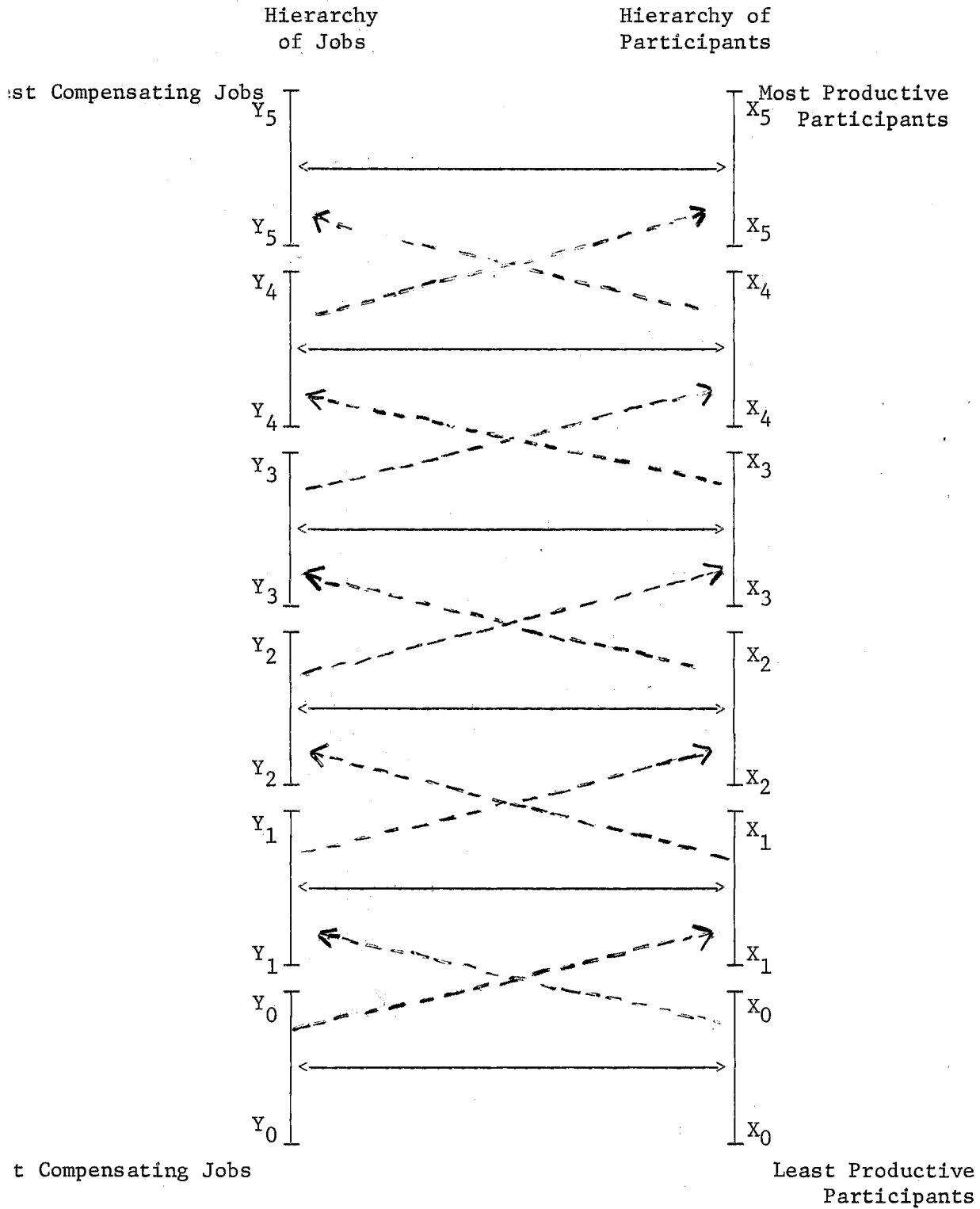
The right continuum represents the hierarchy of labor force sub-groups. It is assumed that objective factors are the all encompassing determinants of a subgroup's relative rank.[7]

The solid arrows indicate the relation between a subgroup's rank and the minimum requirements for which a subgroup can qualify. For instance, the minimum requirements for jobs paying Y_4 is a productivity level of degree X_4, for Y_3 it is X_3, etc. If all labor were allocated in this manner each worker's marginal product would be at its maximum; and thus, total output from society's existing labor force would be maximized.

The broken arrows, by their upward direction, indicate the presumption that some employers will seek "more" productive workers and some workers will, at least initially, seek higher paying jobs.

For simplicity these additional assumptions are made: (1) The level of resource utilization is constant and is such that every participant could be employed at a wage rate equal to the marginal product. (2) Unemployment and job openings occur throughout the entire range. The percentage of job openings at each level of compensation are approximately the same. (3) While unemployed workers will fill jobs, the character and number of job openings and job seekers will remain

---

[7]Objectively an individual's relative attractiveness to employers would be based on purely economic considerations. However, subjective considerations, such as prejudice or ignorance, may alter the ranking. The assumption of a purely objective hierarchy is made for expositional clarity. It will be dropped later to include the probable effects of subjective factors.

essentially the same as additional individuals become unemployed and similar job openings occur.[8]

When a person looks for work, his chances of finding a job in a given period of time are affected by the array of jobs for which he is qualified and is willing to accept. Suppose some unemployed persons in subgroups qualified to degrees X_4, X_2, and X_0 will accept any wage. The range of potential jobs for such persons qualified to degree X_4 is Y_0Y_4; for X_2 it is Y_0Y_2; and X_0 is limited to Y_0 jobs. Thus, the lower one is on the productivity continuum the narrower the range of potential opportunities. Also, other things equal, the lower the acceptance wage, the broader the array of potential opportunities.

But the relation between a lower acceptance wage and the array of employment opportunities also stems from these further considerations: When a job opening occurs, employers will want to hire the most qualified, based on their imperfect information about present and expected future applicants. Just as an individual may expect to gain net returns from "information production" during a period of unemployment, some employers may expect to profit by rejecting an applicant with the minimum requirements (sustain vacancy) and "search" further for more qualified applicants. Consider, for instance, that there are unemployed workers in subgroups higher than X_3 that are willing to accept Y_3 jobs. Thus, some employers, due partly to the element of chance, will be able to obtain such individuals.

---

[8]Note: These assumptions are not meant to imply the rates of unemployment are as low for disadvantaged groups as for others.

On the other hand, some firms will be less fortunate. Unfilled vacancies are costly to the firm and the longer the vacancy goes unfilled the greater the cost and the more inclined the employer will be to lower his aspirations and accept a lesser qualified worker.[9] Thus, among jobs offering the same level of compensation there is a distribution of requirements ranging from the minimum requirements, as defined above, to the highest requirements based on employer expectations. As a consequence, the lower the acceptance wage (relative to qualifications) the greater the proportion of employers willing to offer employment at each lower level of compensation.

The implication of the above discussion is that the expected duration of unemployment should be greater for persons in subgroups concentrated near the bottom of the queue. Such persons are only marginally qualified for the relatively narrow range of lower paying jobs. Moreover, these individuals do not have the alternative of appreciably increasing the array of potential jobs through a lower acceptance wage. Even so, a significant portion of the variation in the duration of unemployment for some subgroups may be explicable by differences in the level of compensation sought rather than personal characteristics that determine a subgroup's relative attractiveness to employers.

---

[9]For a detailed treatment of these ideas regarding the relation between the cost of vacancies and employer hiring standards see Melvin W. Reder, "Wage Structure and Structural Unemployment," Review of Economic Studies, XXXI, October, 1964, pp. 309-322. Reder's views regarding the relative lack of employment opportunities, especially among the unskilled, are presented in this paper. While he does not use the term queue theory, the ideas presented are essentially the same as those presented on page 11 of this chapter.

The Acceptance Wage

The second basic proposition of this thesis is that some of the variation in the duration of unemployment among and even within labor force subgroups is attributable to differences (relative to qualifications) in the level of compensation sought and at least some dimensions of this variability can also be identified and used for policy purposes.

This premise is based on the supposition that the acceptance wage is a function of the cost and expected returns to additional job search. The returns to search are the discounted stream of labor income from future employment. "Expected" returns are based on the mathematical probability of the value of future wage offers that result from investigating among known or suspected alternatives.[10]

Assuming for the present that the individual can borrow freely to finance the period of unemployment, the cost of seeking suitable work would include interest, other explicit cash expense of investigating opportunities, and the implicit cost of income foregone by not more quickly accepting (if available) a lower level of compensation.

When the individual seeks employment he should gain from additional search so long as the present value of the expected marginal gains in income are greater than the marginal cost of search activity. Thus, in attempting to maximize the future returns to search the unemployed job seeker must make a choice as to the terms of compensation he is willing to accept. This economic problem has been expressed as follows:

---

[10]These ideas and the discussion immediately following develop from the article by Mortenson, pp. 847-862.

On the one hand the higher he sets his acceptance wage the longer he can expect to search before finding an offer acceptable to him. On the other, the higher the acceptance wage, the higher the expected wage once employed.[11]

The optimum choice of terms would be that wage offer that equates the expected marginal gains with the marginal cost of search activity.[12] Moreover, satisfaction of this condition would mean an optimum allocation of the labor resource "given the existing cost of information."

But, since information about available alternatives is imperfect, the typical unemployed individual begins the job search with imprecise and limited knowledge of the optimum wage terms. However, factors that would affect the acceptance wage are apparent. Mortenson asserts that an increase in the level of unemployment compensation would decrease the cost of search and should thereby increase the acceptance wage. He also points out that an increase in the discount rate would reduce the present value of future returns to search and thereby lower the wage an individual is willing to accept.[13]

An earlier article by Holt and David discusses in considerable detail the circumstances that would seem to affect the acceptance wage.[14] They too recognize the importance of factors that affect the net gains to search, and in addition, point out that the experience gained from the time spent looking for work should bring the individual's acceptance wage more closely in line with existing opportunities.

---

[11]Mortenson, p. 848.

[12]This, of course, assumes the typical production function of diminishing returns to inputs.

[13]Mortenson, pp. 847-862.

[14]Holt and David, pp. 73-109.

Holt and David have hypothesized that while the initial accept-
ance wage of a job seeker is influenced by his last wage, what others
are getting, and perceived opportunities, it is likely to be set
higher than the previous wage in order to hedge against a too quick
acceptance of an unnecessarily low wage. Thus, it is hypothesized
that the worker often begins his job search with an acceptance wage
that is higher than he is likely to be offered in the immediate future.[15]

Offers below his acceptable threshold will be rejected. How-
ever, if the job search continues without success, wage aspirations
should decline.[16] First of all, the weight of experience serves to
convince him that high aspirations are "not likely to be fulfilled in
the present situation."[17] Secondly, continued search becomes more
painful ". . . as the family's financial and emotional resources are
consumed by continued failure to find an acceptable job."[18]

Since the typical unemployed individual does not have access to
prolonged and unlimited credit, the emotional strain of continued un-
employment when associated with depleted financial resources suggest
a situation whereby the unemployed job seeker may "feel the pressure"
to forego further search by accepting a lower paying job. Such

---

[15]Holt and David make clear that much remains to be learned
about aspirations and job search behavior, and that they are merely
hypothesizing.

[16]Holt and David assert that the lower limit of the acceptance
wage will be reflected by the unemployment compensation available.

[17]Holt and David, p. 90.

[18]Ibid.

pressures should become increasingly apparent as the period of unemploy-
ment is extended. In more formal terms, as a family's economic
reserves near exhaustion, the marginal cost of further search activity
begins to exceed the present value of expected marginal gains of such
activity.

The proposition should lend itself to testing. Higher (lower)
levels of wealth and other family income will decrease (increase) the
rate of discount of future income and thus should lessen (increase)
the probability of more quickly accepting a lower wage.[19]

The expected level of wage offers (gross values) over a period
of search time has not yet been explicitly considered. No one to this
writer's knowledge, has attempted to formulate precisely the shape
of an offer "curve." However, it does seem possible to make some
inferences based on probabilities and rational search behavior. The
discussion immediately following is a development of what Alchian
presents as "a simple fruitful characterization of the search for
information."[20]

A situation is assumed whereby the gross returns to search
accrue as a result of sampling among an array of offers (or bids) with
some mean and dispersion of values. All alternatives remain open,
i.e., offers can be hoarded and responded to at a later date. Thus:

---

[19]The point was earlier made that unemployment compensation
would also decrease the cost of income foregone by the job searcher.

[20]Alchian, p.110. For an earlier similar contribution to job
search theory (to which Alchian gives acknowledgment), see George J.
Stigler, "Information in the Labor Market," Journal Pol. Econ., LXX,
Supplement, October, 1962, pp. 94-105.

As the sample is enlarged, the observed maximum value will
increase on the average at a diminishing rate. Assuming
search (sampling) at a constant rate, with time thereby
measuring size of sample, the expected (mathematical ex-
pectation of the) maximum observed value will rise from the
median at a diminishing rate toward the upper limit of
the distribution. That limit will exceed the past actual
price, since there is no necessity for the past sale
[offer] to have been negotiated at the highest possible
price (with exhaustive prior sampling regardless of cost).[21]

Such a hypothetical expected offer curve showing smaller and

smaller expected yields to additional equal increments of search time

is shown below.

Figure 2

Offer Curve
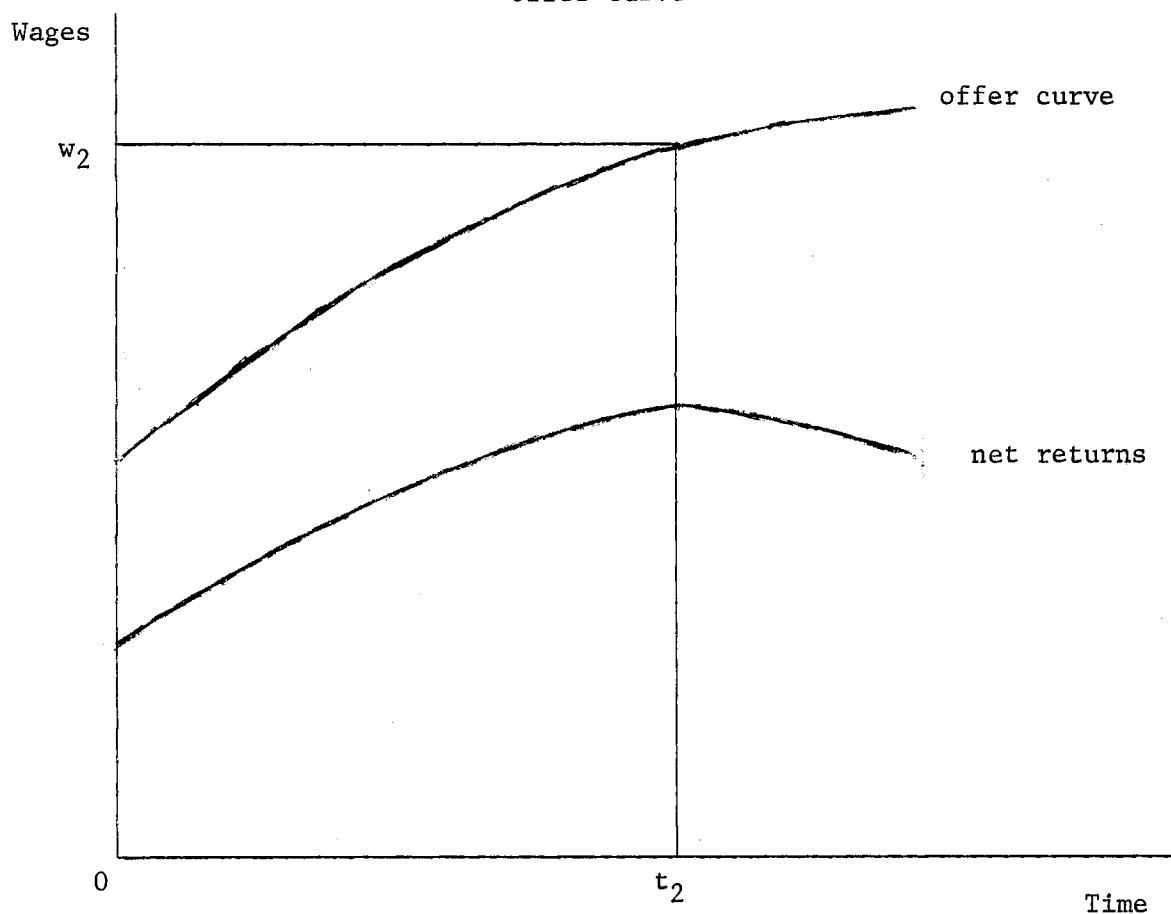
21Alchian, p. 110.

The net returns curve results from discounting the value of future wage offers and subtracting search cost. The expected net returns to information production would be maximized at a wage of OW_2 after a period of OT_2 time has elapsed.

The next diagram depicts an additional hypothetical situation combining the above identical offer curve with Holt and David's aspiration concept. The aspiration curve illustrates the hypothesized relation of the acceptance wage level to duration of unemployment. It is initially set at OW_3 which is higher than the previous wage rate, but later declining as the job seeker becomes more cognizant of existing opportunities and the family's emotional and financial resources become more strained.

Figure 3

Offer Curve and Acceptance Wage
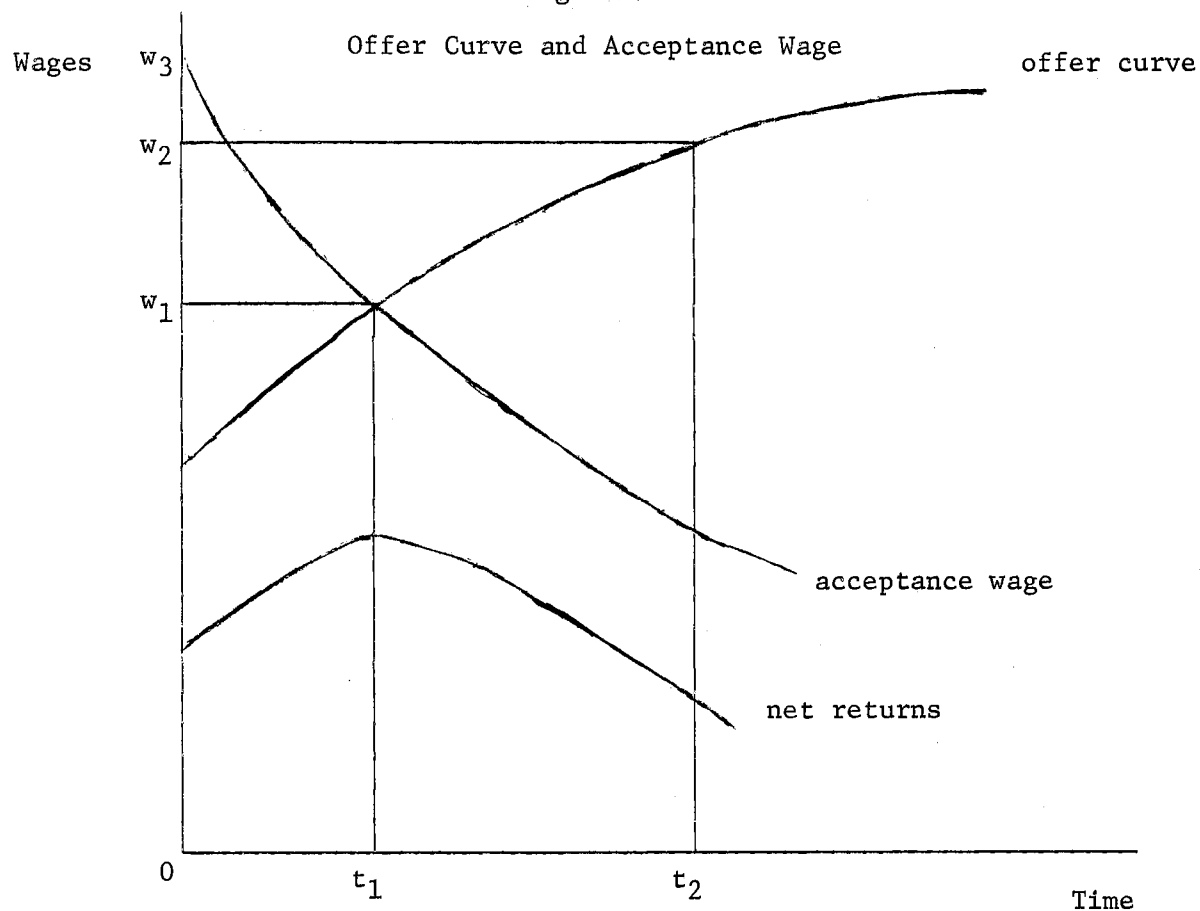
The optimum wage is lower in this instance at OW_1 after only OT_1 time has elapsed. The situation is contrived to emphasize that the individual may feel the pressure to accept a lower wage at an earlier stage of search as a result of financial reserves that are insufficient to support continued investment in information production; i.e., as demonstrated by the more rapidly decreasing net returns curve, depleted resources decrease the present value of expected future income.

No one has actually suggested that the job search is, in fact, a mere random sampling of potential employers at some constant rate. When the decision is made to seek employment the quality of information about known or "suspected" vacancies will vary; and through selectivity the job seeker can more efficiently utilize his search time.

Furthermore, the quality--as well as the quantity--of information may be significantly improved by contact with employment agencies and acquaintances, informal inquiry and surveys of help wanted ads. These efforts would logically occur in the early stages of search and can result in prior identification of "relevant" employers and prior knowledge of openings, thereby leading to more efficient use of search time.

The immediate result of such groundwork activities should be a more rapid and exhaustive sampling of "higher wage" vacancies. This suggests the possibility of higher marginal returns early in the search period (provided the individual were qualified for the jobs he is investigating) than one would predict from random search; but more rapidly diminishing returns in later stages as a result of prior exhaustive sampling.

Moreover, if the assumption is made that only some offers can be hoarded and even then for limited periods of time, prolonged search will be even less fruitful.

Conclusion

This chapter has attempted to establish a theoretical framework
for analyzing the variation in the duration of unemployment. We have
suggested that factors relevant to the acceptance wage may explain some
portion of duration, but because of limitations imposed by the data,
the validity of this premise cannot be fully explored on an empirical
basis by this thesis. Information as to financial and other kinds of
wealth is not available for the group under study. However, it does
not appear reasonable to expect that subgroups near the bottom of the
queue would experience relatively longer jobless periods by virtue of
accumulated wealth.

The unemployed persons under study do have weekly unemployment
benefits as an alternative source of income, but no one would expect
an individual to willingly accept a job in which the net level of com-
pensation did not exceed unemployment payments. Mortenson has suggested
a comparison of states with different levels of unemployment compensa-
tions as a means of testing the relation between duration and the
weekly benefit rate.[22] If detailed information were available on the
individual participant's personal endowments, then his suggestion
would presumably allow us to simultaneously observe subgroups of
homogeneous personal characteristics but with different levels of
benefits.

But the CLASP experiment was conducted within the State of New
York and the weekly benefit is computed on a sliding scale according

---

[22]Mortenson, p. 13.

to past earnings.[23] While the data do provide considerable information about personal factors, it is presumed that the rate of unemployment compensation does correspond closely (and positively) to the participant's productive potential, i.e., those individuals that we expect to experience longer duration because of their relatively disadvantaged status should also, on the average, be those who are entitled to the lower weekly benefit rate. As a consequence of the data, empirical contributions regarding the relevance of wage aspirations to duration are limited. However, as noted at the end of Chapter I, inferences concerning aspirations will be made on the basis of the empirical analysis to be undertaken in Chapters IV and V.

In considering the soundness of the earlier assumptions that lead to the premise that disadvantaged job seekers have more limited job opportunities, it seems appropriate to emphasize that there are so-called "secondary" workers employed at what may be considered undesirable jobs in the sense that the jobs are low-paying, temporary or part-time, or otherwise unappealing. Some economists have even argued that these kinds of employment are plentiful and may be quickly obtained.

---

[23]The average weekly benefit rate ranged from as low as $10 for persons with an average weekly wage of $16 to a maximum of $54 for those with an average weekly wage of $109 and above. Other selected comparisons of weekly wages and benefits were:

Average Weekly Wages:	$30-32	42-45	67-70	89-91	99-101
Benefits:	$ 20	25	35	45	50

Source: New York State Unemployment Insurance Information for Claimants, New York Department of Labor, Division of Employment (New York, 1967), p. 15.

Piore, for instance, has referred to the secondary labor market as one to which the urban poor are confined.[24] According to Piore, the duration of unemployment among many of the urban poor is only slightly longer than for the labor force as a whole, even though the rates of unemployment are exceptionally high. This duration-high rate phenomenon is explicable by high turnover (quit rates) in the secondary labor market. Not only are such jobs relatively unrewarding, but another similar type job is easily (cheaply) obtainable.

He presents some statistical evidence to support the hypothesis but cautions that his findings should be regarded as tentative. "The statistical techniques are crude and other variables, such as sex, age, participation rates, and unemployment insurance coverage might explain the results."[25] Piore's reasoning is of course consistent with Alchian's contention that jobs are always available.

Such a dichotomy between the so-called secondary labor market and other markets seems overdrawn and the relevance of these ideas for our study is not clear on an a priori basis. As just noted, additional empirical research seems called for regarding the idea that unappealing jobs are plentiful for the so-called disadvantaged.

As the reader is already aware the CLASP data appear well suited for testing the relation between duration and many of the personal factors that have been hypothesized to affect employment oportunities. While the issue as to whether some disadvantaged persons are unemployed

---

[24]Michael J. Piore, "Public and Private Responsibilities in On-the-Job Training of Disadvantaged Workers" (unpub. manuscript; M.I.T., 1968), p. 2.

[25]Piore, p. 4.

longer because of limited job opportunities or because there is a lack

of "desirable" jobs will not be emphatically resolved by this thesis,

the empirical results of the study should provide valuable information

by more clearly identifying those persons that experience longer than

"normal" spells of unemployment.

CHAPTER III

DURATION OF UNEMPLOYMENT: PERSONAL FACTORS

In this chapter we shall enumerate and discuss a group of personal

characteristics that are considered indicative of a participant's

relative position in the queue. The emphasis throughout will be upon

the rationale for the selection of each characteristic. The data

to be analyzed in the next chapter will be used to test for the

variation in the duration of unemployment among these factors.

Subjective hiring standards based on prejudice or ignorance

can of course limit the array of job opportunities for some subgroups.

Therefore, consideration will be given to the possibility of discrimi-

nation by race and sex. The discussion of other personal attributes

will be limited to economic considerations.[1]

Since the data to be examined are composed of a group of unem-

ployment insurance recipients for the year 1967-68, it seems appro-

priate to continue with the assumption of a high level of aggregate

demand. Given such economic conditions the relation between longer

duration and the degree of disadvantageness is not expected to be

---

[1]Discrimination--hiring standards that are "too high" and are
not justified by economic rationale--is often alleged to be a partial
explanation for the disadvantaged status of the aged and those with low
education achievement. Even if such allegations are correct, the fol-
lowing discussions will take the position that economic factors inher-
ent to both groups should substantially limit job opportunities.

linear. Rather, as a consequence of the high level of resource utilization for the period under study, rank along the continuum would seem relevant to longer duration only for those participants concentrated at or near the bottom.

Furthermore, in a tight labor market some factors indicative of disadvantaged status may contribute to longer than average periods of job search only when they exist in combination with one or more other disadvantaged factors.[2]

Skill

Skill, within the context of this study, refers to the job seeker's current productivity potential, ceteris paribus.[3] It is recognized however--and will be considered shortly--that factors other than the more immediate level of productivity are likely to enter into the employer's hiring decision.

It would be much less of a problem to discern skill status within a given occupation than for the labor force as a whole. For instance, the distinction between journeymen and apprentices of a certain craft is obvious. Similarly, within a department or discipline of a university the ranks of professors are supposedly indicative of relative competence and performance.

---

[2]To further clarify the point consider the possibility that subgroups that are either aged or poorly educated but not otherwise identified by low status factors, are able to find work within a "normal" period of time; but that job seekers who are both aged and lacking in education do experience a significantly longer than average period of unemployment. The question of interactions and the problems it may present for statistical analysis will be more fully explored in Chapter V.

[3]i.e., productivity inherent to the worker. Other things equal refers to such factors as non-human capital and technology.

However, in comparing different occupations among industries and institutions, or even within a given place of employment, relative skill levels are less apparent. Even so, when such is of interest to the researcher, the more conventional approach is to classify the various occupations as accurately as possible into three broad categories: skilled, semi-skilled, and unskilled. However, in our analysis we cannot do this because the data lack the specific information.

An alternative approach--which will be used--is to rank individuals according to relative wage rates on the premise that each is paid according to his marginal product. Probably the most obvious shortcoming of this technique is that the wage structure, due to imperfections in the labor market, does not fully reflect relative skill status for all participants under consideration.[4] Moreover, some job-seekers may have become unemployed because of a secular decline in demand for their particular occupation.

While recognizing the inherent problems that do exist when using past income as a proxy for productivity, the classification of a large group of heterogeneous participants--according to recent wages--should at least serve as a useful approximation of comparative skills. This method appears particularly conducive to distinguishing subgroups of very low skill from the rest of the labor force.

---

[4]For example, some newly unemployed persons may have previously received wages higher than prevailing alternatives becuase of union membership or tenure.

Education

The following statement seems appropriate as an introduction to the relevance of education to the variation in the duration of unemployment. According to Oi, ". . . decisions regarding the labor input can no longer be based solely on the current relation between wages and marginal value products, but must also take cognizance of the future course of the quantities."[5]

The level of education achievement is one of the major criteria used by employers to establish hiring standards. While the significance attached to education does vary--even among employers seeking to fill similar or identical jobs--there seems to be no doubt that a positive relation exists between the level of education and the array of jobs for which a person can qualify.[6]

The association between education and occupational skill is well established. However, among those who have not had the experience or formal on-the-job training necessary to develop job skills, the level of education would appear more relevant as an indicator of individual potential than would the immediate level of marginal product.

As Mincer reminds us, formal education is a general or preparatory stage of the training process. The acquisition of occupational skill comes about as a result of both formal and informal training after entry into the labor force. Persons with less formal education

---

[5] Walter Y. Oi, "Labor as a Quasi-Fixed Factor," Journal of Political Economy, LXX, December, 1962, p. 539.

[6] Hiring Standards and Job Performance, U. S. Department of Labor/Manpower Administration, Manpower Research Monograph #18 (Washington, 1970), pp. 1-34.

must typically undergo more lengthy and expensive on-the-job training

programs in order to achieve a given level of competence.[7]

More recent research by Thurow offers similar evidence as to the

effect of education on training cost and future productivity. "As

education levels rise, training costs fall and the variety of training

which can be given expands."[8] Moreover, it seems particularly signifi-

cant to note that Thurow's research indicates strong complementarities

between formal schooling and the returns to on-the-job training and

experience. With complementarities, training and education together

result in benefits that are greater than the sum of the two separately.

Conversely, continues Thurow, low education achievement makes

some types of training expensive and other types impossible.[9] Since

complementarities work in the opposite direction, the implications for

the unskilled job-seeker with little formal education seem apparent:

When workers are identified by low skilled status, either by the nature

of past employment and/or insufficient job training, or simply because

of inexperience (such as among the young); and when this situation

exists in association with very low levels of educational achievement,

there would seem to exist a combination of factors that would lessen the

chances of finding work in a given period. Not only are such individuals

---

[7]Jacob Mincer, "On-the-Job Training: Costs, Returns, and Some Implications," The Journal of Political Economy, LXX, Supplement, October, 1962, pp. 51-73. According to Mincer's study, as the level of education rises the employer's outlay for training costs also rises but this is because of the kinds of jobs the more educated are usually trained for.

[8]Lester C. Thurow, "The Occupational Distribution of the Returns to Education and Experience for Whites and Negroes," The American Statistical Association, Social Statistics Section Proceedings, 1967, p. 233.

[9]Ibid., p. 233.

among the least productive, but they are also expensive to train and lacking in potential.

<div align="center">Age</div>

The discussion of age is divided into three categories: younger workers, a middle or so-called "prime age" group, and older workers. Economic theory supported by existing data and empirical studies indicates that "prime age" workers, on the average, have more of the characteristics that employers prefer than the very young and older groups.[10] Thus, this section is couched in terms of the relative disadvantaged status of the latter two groups.

Older Workers

In beginning the discussion of the expected relation between age and duration it seems appropriate to remind the reader that age is strongly related to certain other factors that are presumed to affect employment opportunities.

Typically the unemployed older worker has less education and fewer marketable skills than the other members of the labor force. He is more likely to have those skills that are becoming obsolete due to technological change. Also, he is commonly displaced from a job of long tenure and is more prone to remain in declining industries, occupations and labor market areas.[11]

---

[10]For a comprehensive discussion of the attributes of the "prime age" group see William G. Bowen and T. Aldrich Finegan, The Economics of Labor Force Participation (Princeton, 1969).

[11]I. Sobel and H. Folk, "Labor Market Adjustments by Unemployed Older Workers," Employment Policy and the Labor Market [ed. A. M. Ross], (Berkeley, California, 1965), p. 333.

Even so, higher age per se is apparently a factor in limiting the array of employment opportunities. After a person enters the labor force, productivity and skill typically increase as a result of experience and training. However, at some point in many workmen's careers skills begin to depreciate and the productivity-experience relation becomes negative.[12]

One study regarding the job search problems of unemployed older workers lists declining mental and physical abilities as among the reasons most often given by employers for not wanting to hire older workers. The other most common objections voiced by employers were: (1) slow recovery from illness and injury, (2) policies regarding seniority and promotion from within the firm, and (3) higher insurance and pension cost.[13]

Other rationale for the reluctance of some employers to hire older workers is suggested by Oi's concept of labor as a quasi-fixed factor. According to Oi the firm incurs certain fixed cost in the process of hiring and training new personnel. These fixed outlays are amortized over the period of the worker's employment with the firm. But average fixed cost would tend to be higher for older workers because

---

[12]Thurow, "Returns to Education Experience," pp. 233-243. In Thurow's study participants were grouped according to several broad occupational categories. It was observed that the income elasticities (which Thurow regards as a surrogate variable for productivity) associated with years of work experience, were positive for all groups for the first sixteen years. For most blue collar personnel the income elasticities were negative for the period of 16-35 years' employment, and thereafter. For the professional and managerial classes no negative relation was observed until after 35 years.

[13]R. C. Wilcock and W. H. Franke, Unwanted Workers, Permanent Layoffs and Long-term Unemployment (Glencoe, Ill., 1963), p. 55.

they have fewer working years left during which such cost may be amortized. Moreover, according to Oi's research these initial hiring expenses tend to be positively related to skill requirements and the rate of pay. Thus, the aged job seeker may be at a substantial disadvantage when seeking compensation comparable to past employment.[14]

In addition to the relative disadvantaged status of the older job seeker, longer duration may be partially attributed to wage aspirations and inflexible job search behavior.

Sobel and Folk have made the following observations: typically the unemployed older worker is displaced from a job of long tenure. Due to custom or formal agreement tenure can offer protection from the competitive pressures of the market and result in wages that are higher than prevailing alternatives. Thus, when such a person becomes unemployed it may be especially difficult or impossible to find employment at or near the previous level of compensation.[15]

The probable influence of recent wages on the initial acceptance wage has been noted, but according to Sobel and Folk the willingness to accept lower wages as the jobless period lengthens is inversely related to age. Similar inflexibility among the aged was also observed regarding the lack of willingness to undergo training, enter a new occupation or move to a new location.[16]

---

[14]Oi, pp. 538-555.

[15]Sobel and Folk, p. 351. This also suggests that prior earnings are a less suitable proxy for skill when considering older workers.

[16]Sobel and Folk, pp. 336-353.

These peculiarities among the aged job seeker were attributed (by Sobel and Folk) to an apparent unrealistic appraisal of job market opportunities; the feeling that finding a job was more a matter of fortuitous circumstances rather than good judgment and rational search behavior.[17]

Nevertheless, if older workers are generally less disposed to make adjustments in job search, one may hypothesize that factors relevant to the cost of remaining unemployed are at least a partial explanation. Specifically, such factors would include a higher level of accumulated wealth and alternative sources of income such a company pensions and federal social security benefits, now or in a relatively few months.

Younger Workers

It is widely recognized that an exceptionally high incidence of hard-core unemployment exists among very young members of the labor force. The young job applicant may be regarded as of uncertain quality by prospective employers by virtue of an unproven and limited employment record. Also, for males there is often the pending possibility of military service.

The primary problem may, however, result from the fact that the young job seeker is often identified by other factors presumed to lessen employment opportunities. First, a large percent of those who enter the labor force at an early age are school drop-outs and have comparatively low levels of educational achievement. Also, because of little prior

---

[17]Ibid.

work experience and on-the-job training, youthful participants as a group, are inherently less skilled than other workers.

Among older youths (say 20-24 years of age) there should be more variation in skill levels than among teenage participants. On the other hand, unskilled status among teenagers may be so universal that the separate effects of age and skill cannot be fully accounted for through statistical analysis.

Racial Discrimination

According to Thurow, "Racial discrimination exists whenever race is a factor in predicting [employment] opportunities."[18] But it is not clear on an a priori basis that discrimination in hiring was of any consequence in the New York City area for the years 1967-68. Prior to this time, legislation prohibiting discrimination in hiring had been in effect for several years. Moreover, these practices have traditionally been less prevalent in the urban North than in other areas.[19]

Generally speaking, as is so often the case with disadvantaged groups, the problem of many black job-seekers is related to other factors that limit opportunities. Compared to whites, minority groups, on the average, have less education and are concentrated disproportionately in low skilled jobs.[20] However, low education and skill status are not

---

[18]Lester C. Thurow, _Poverty and Discrimination_, p. 2.

[19]Discrimination in hiring does not necessarily result from prejudicial attitudes on the part of employers. Employers might hesitate to hire minority groups for fear of adverse reaction among white workers. In some instances unions have also been instrumental in excluding minority groups from potential jobs.

[20]H. J. Gilman, "Economic Discrimination and Unemployment," _American Economic Review_, LV, December, 1965, pp. 1077-1096.

universal among such persons. If discrimination does exist in the labor market area under consideration, a differential in duration between races, not accounted for by other explanatory variables, <u>may be indicative</u> of discriminatory hiring policies.[21]

In analyzing socioeconomic data the researcher typically does not have all the information at hand or is not aware of all possible contingencies relevant to the analysis. With particular regard to minority groups for this study, information is available on levels of educational achievement but the data do not permit adjustments for possible differences in the quality of education. Furthermore, <u>past</u> discrimination can result in <u>current</u> obstacles to finding work; for instance, lack of motivation or abhorrent social and personal qualities.

Thus the choice of the above underlined words--<u>may be indicative</u>-- is intended to caution that any statistically significant difference in duration among the races should not be regarded as conclusive evidence of current discrimination.

<div align="center">Sex</div>

On an a priori basis, sex as an explanatory factor in duration of unemployment appears ambiguous. A large proportion of the sample to be considered are women. Supposedly discriminatory hiring practices are of some consequence against women. Moreover some housewives are alleged to be more selective about the kinds of jobs they will accept because of the opportunity cost of services foregone in the home.

_____

[21]There are a large number of Puerto Ricans among the group under study. The analysis will also test for alleged discrimination against these workers.

Both of these factors should increase the duration of unemployment. On the other hand, some women may seek only part-time or temporary work and would thus be more inclined to accept a variety of employment.

Industry Factors

Thus far, the discussion of personal characteristics has been formulated to apply to unemployment insurance recipients in general. For this particular study, the earlier assumptions of static equilibrium conditions (in the aggregate sense) and a high level of resource utilization seem appropriate.

Nevertheless, the structure of demand for labor is not likely to be constant for any labor market, or identical among different labor markets. The kinds of labor demanded will vary from one geographical location to the other according to such factors as industrial composition and employment trends within these industries.

Therefore, at least some dimensions of local labor market conditions will be considered in the next chapter. Specifically, for the group under study, attempts will be made to ascertain the possible significance of industrial attachment to the variation in the duration of unemployment.

CHAPTER IV

EMPIRICAL FINDINGS: DURATION OF UNEMPLOYMENT

Specific hypotheses have been enumerated regarding the expected
relation between selected personal characteristics and the variation in
the duration of unemployment. These relations will be estimated in
this chapter for the particular group under study through the use of
least squares analysis. In addition, since some variation in duration
should be accounted for by the structure of economic activity, the
participant's industrial attachment will be included in the estimating
equation. Also some inferences as to the relevance of aspirations to
duration will be attempted in this chapter and in Chapter V.

The chapter is developed in the following order. The first
section discusses the procedure for editing of data. This is followed
by a presentation of the independent and dependent variables. Next
the statistical techniques are explained, and the regression results
are presented and discussed. An interpretation of the statistical
results is presented in the last major section.

The data that are to be analyzed have been previously discussed
in various sections of this thesis. The reader may find it especially
worthwhile at this point to review the initial discussion of data on
pages 5-7.

Editing of Data

During the course of the CLASP study, information was recorded

for approximately 15,000 unemployed insurance claimants. However, a

large percentage of the group are excluded from this analysis for

various reasons. First, the measure of duration provided by CLASP

records extends only over the period for which the claimant received

unemployment insurance. It was therefore necessary to exclude all

claimants who were initially ineligible for benefits since no record

of duration is available for such persons. Approximately 30% of the

sample size were excluded for this reason.[1]

In addition to those claimants mentioned above, approximately

2,700 other individuals were declared ineligible to receive further

compensation after payments had begun. These persons were also ex-

cluded from the sample since the duration measure was truncated at

the time of disqualification. While this later group is not included

in the basic estimating equations, we will, in Chapter V, attempt to

ascertain if there is a relation between personal factors and the

incidence of disqualification.

Recalling Chapter I, it was noted that the CLASP experiment

divided the claimants into equal sized test and control groups according

to odd and even last digit social security numbers. Each group was

further classified into three subgroups--I, II, and III--according to

their prospects for re-employment.

---

[1]For many of this group no record of earnings was recorded for
the previous year, which suggests that they were unemployed. Perhaps
many were new labor force entrants.

The initial criteria for classification of all participants and the kinds of services given each subgroup of the test population are described below. While those in control were classified according to the same criteria, the reader is reminded that the control claimants received only the standard services of the employment service office. Thus test and control participants were classified according to the same criteria but only the test population received the services herein described.

Group II consisted of those who in the opinion of CLASP interviewers had marketable skills but no immediate prospects for returning to work. For those persons a claims examiner at the unemployment insurance office ". . . developed a job search plan on an individual basis."[2] This plan was followed up at frequent intervals by the claims examiner to determine if the plan was being carried out. "The plan was modified, as required, to make it more effective. Some claimants who seemed to need more help were transferred to Group III, some were transferred to Group I, and others were questioned for possible disqualification."[3]

Group III, according to CLASP, was made up of individuals who appeared especially disadvantaged in terms of prompt or stable re-employment. Included in this category were those whose skills were becoming obsolete, unskilled persons, those wishing to change occupations and those with personal impediments to stable employment.

---

[2]New York Department of Labor, Division of Employment, CLASP: Report on Research Findings Based on the Experimental Advisory Service Program for Unemployment Insurance Claimants, Operations Study No. 3 (Albany, N.Y., April, 1970), p. 2.

[3]Ibid., pp. 2-3.

These persons were referred to an employment service office for counseling interviews, and in some cases the individual elected to undergo job training provided by the Manpower Development and Training Act. "Follow-up interviews at appropriate intervals were held with claimants at the employment insurance office concerning their progress, their appropriate group classifications, and their continuing eligibility for benefits."[4]

Group I consisted of those who expected only temporary unemployment. Many among this group expressed the belief that they would be recalled to their former jobs or to similar types of jobs within a short period of time. All within this category expected to be re-employed within 10 weeks. The only differential treatment rendered to those that remained in this category was that they were not required to register with the Employment Service Office for help in finding new jobs. However, some of these individuals were later reclassified into categories II-III for special services.

All control claimants retained the same classification throughout the entire benefit period. But as noted above, many of the test claimants were reclassified periodically throughout the benefit period. According to CLASP, "Group classifications . . . were changed for individual claimants as circumstances warranted."[5]

The original reason that CLASP divided the claimants into two equal and apparently homogeneous test and control groups was to evaluate the effectiveness of the CLASP program. However, because of the

---

[4]Ibid., p. 3.

[5]Ibid., p. 3.

reshuffling of test claimants among the various subgroups and the subsequent differential services given persons at different stages of the unemployment period, no attempt will be made in this thesis to estimate the effect of the CLASP services on the length of unemployment.

Therefore, in order to abstract from these problems, it was decided to exclude all persons in the test category from the basic analysis. Since the test and control groups do appear to be homogeneous, this decision should not bias the statistical analysis. It does, however, reduce the remaining sample size by approximately 50%.[6]

Other claimants for whom missing data occurred were also excluded. The remaining sample for which statistical estimates will be made consisted of 3,354 persons.

Presentation of Variables

Dependent Variable: Duration of Unemployment

The measure of duration is a single spell of unemployment for which each individual received unemployment compensation, and this measure is truncated for the exhaustees.[7]

---

[6]The categorical percentages for exclusion are not additive because many persons fall into more than one category.

[7]Therefore the duration estimates will be understated for persons who exhausted their unemployment benefits (except where the person became unemployed at the very end of his benefit period). However, in this case the problem is not thought to be serious because only 5.9% of the entire sample were unemployed for the entire benefit period.
    For a discussion of the problems encountered when applying regression analysis to a situation where the values are concentrated at some limit see Arthur S. Goldberger, Econometric Theory (New York, 1964), pp. 251-255.

According to New York state law, the first three days of unemployment are not compensable. Thus, for all persons who returned to work no later than the fourth day after registering for benefits, the recorded duration is zero. If, however, he is still unemployed seven days after the filing date, he is eligible for one week's benefits.

It must be noted that <u>each full week of unemployment is recorded as four days</u>. Thus a person out of work for three consecutive weeks would have a recorded duration of twelve days. For participants out of work for ten weeks, the recorded duration would be 40 days. The maximum period for which a person could receive benefits was 26 weeks and this maximum measure of duration is recorded as 104 days.

Independent Variables

On Table I is a complete listing of each predictor that is to be tested. No precise functional relation is hypothesized among the predictors of the various categories. Inc1 through Inc7 represent average earned income per week for the previous year. As pointed out earlier, recent earnings are used as a proxy for skill. A priori, it is not known just what the most relevant subclasses are, but for added precision recent earnings are subdivided into several subclasses that become increasingly narrow from high to low. It is expected that those concentrated among the lower classifications of the "earning power" scale will experience the longer duration.[8]

---

[8]The scale is not intended to typify the wage hierarchy of the entire labor force. Except for Inc7, it is intended to be more representative of the middle and lower wage earning groups. Of course, some among the lower groups may typify what Piore has referred to as secondary labor market participants.

TABLE I

LISTING OF PREDICTOR CLASSES

WEEKLY INCOME
Inc1	$\leq$ 39
Inc2	40- 50
Inc3	51- 70
Inc4	71-95
Inc5	96-120
Inc6	121-150
Inc7	$\geq$151

SEX
| Sm | Male |
| Sf | Female |

AGE
Ag1	$\leq$19 years
Ag2	20-24
Ag3	25-45
Ag4	46-59
Ag5	60-64
Ag6	$\geq$65

EDUCATION
Ed1	0- 8 years
Ed2	9-11
Ed3	$\geq$12

RACE
| Rw | White |
| Rm | Minority Status |

INDUSTRY
Ind1	Manufacturing--Apparel
Ind2	Manufacturing--Metals, Machinery
Ind3	Manufacturing--Other
Ind4	Construction
Ind5	Transportation; Public Utilities
Ind6	Wholesale Trade
Ind7	Retail Trade
Ind8	Finance, Real Estate, Insurance
Ind9	Services
Ind10	Other

GROUP CLASSIFICATION
Gr1	Class I
Gr2	Class II
Gr3	Class III

Sm and Sf represent male and female participants in that order.

Ag1 through Ag6 are the age predictors. We have hypothesized that younger and older age groups will experience longer duration relative to the middle group. However, the six age classifications are specified in anticipation of obtaining a better defined relation between age and duration.

Predictors for education achievement fall into three classes:
Ed1, Ed2, and Ed3. They are 8th grade or less, more than 8 grades but
less than graduation from high school, and high school graduate or
above.

The race predictors Rw and Rm represent white and minority status
respectively. Those falling into the latter category include blacks
with and without Spanish surnames and whites with Spanish surnames.

Ind1 through Ind10 represent the type of industry in which the
participant was last employed. The description of each is shown in
the form furnished by CLASP.

Predictors Gr1, Gr2, and Gr3 represent CLASP groups I, II, and
III respectively: The earlier described classification received by
each claimant on the basis of his prospects for re-employment.

Statistical Techniques and Results

Ordinary Least Squares

A single equation least squares multiple regression technique
is used to estimate the relation between duration and the preceding
predictors. All explanatory variables are in dummy form and some basic
features of the statistical procedure will be briefly discussed.[9]

When n mutually exclusive subclasses of a given discrete explana-
tory variable are to be taken into account in one equation, then n - 1

---

[9]A variant of this technique, a stepwise procedure will be also
used at a later stage of this chapter.
    For a more detailed discussion of the use of dummy variables in
multiple regression analysis, see J. Johnston, Econometric Methods
(New York, 1960), pp. 223-227; or Goldberger, pp. 224-227.

dummies are needed to represent the subclasses of that variable. For instance, there are five dummy variables representing the six classifications of age.

X_8 = 1 if less than 20, 0 otherwise;

X_9 = 1 if 20-24, 0 otherwise;

X_{10} = 1 if 25-45, 0 otherwise ($X_8 = X_9 = X_{10} = X_{11} = X_{12} = 0$
   if age is the omitted class 45-59);

X_{11} = 1 if 60-64, 0 otherwise;

X_{12} = 1 if 65 or over, 0 otherwise.

Whenever the equation takes into account more than one discrete explanatory variable (each with mutually exclusive subclasses) then n − 1 dummy variables are needed to represent the n classifications of each discrete independent variable. Thus by omitting one subclass from each group, it can be seen from Table II that 26 dummies (X_i) will be needed to estimate the equation that takes all the specified predictors into account. The equation is shown below:

(1) $Y = b_1 + b_2 Inc1 + b_3 Inc2 + b_4 Inc3 + b_5 Inc5 + b_6 Inc6$
   $+ b_7 Inc7 + b_8 Sm + b_9 Ag1 + b_{10} Ag2 + b_{11} Ag3 + b_{12} Ag5$
   $+ b_{13} Ag6 + b_{14} Ed2 + b_{15} Ed3 + b_{16} Rw + b_{17} Ind1 + b_{18} Ind2$
   $+ b_{19} Ind3 + b_{20} Ind4 + b_{21} Ind5 + b_{22} Ind7 + b_{23} Ind8$
   $+ b_{24} Ind9 + b_{25} Ind10 + b_{26} Gr1 + b_{27} Gr3.$

b_1 represents the estimated duration for the omitted subclasses; and each other b_i coefficient represents an estimate of the net

difference in duration between a given predictor of a group and the

omitted predictor of that particular group.[10]

The regression results are shown in Table II. Estimated duration

for a person identified by all the omitted subclasses is $b_1 = 43.5$ days.

Estimated duration for an individual identified by the equation below:

(2) $Y = b_1 + b_7 Inc7 + b_8 Sm + b_{10} Ag2 + b_{14} Ed2 + b_{16} Rw + b_{22} Ind7$

   $+ b_{27} Grl$, is

   $Y = 43.5 - 5.8 + 0.7 - 3.4 + 1.6 + 1.2 + 6.8 - 17.5$

   $= 27.1$ days.

One or more subclasses of age, income, industry, and CLASP

variables are observed to be statistically significant at the .05

level. These are Inc7, Ag1, Ag5, Ag6, Ind1, Ind7, and Grl. However,

the results do not indicate any significant variation in duration

attributable to differences in sex, race, or education.

In addition to the preceding significance tests performed on

the individual coefficients, other tests were made where the entire

set of dummy variables within certain groups were tested as a given

factor. The technique for testing a given factor is based on the

difference between the R^2 that is obtained when all variables are

included in the equation and the R^2 that is computed when the explana-

tory variables of the factor of interest are omitted. When these

---

[10]The regression coefficients (b_i) represent the cell means of
the predictors in deviation form—with the effects of intercorrelation
removed. "Estimating the separate effects of intercorrelated predictors
is, of course, the main advantage of techniques like multiple regression
. . . analysis . . . . Of course, where intercorrelations are extremely
high, it appears to be necessary to remove one of the variables from the
analysis." John A. Sonquist, Multivariate Model Building, The Valida-
tion of Search Strategy (Ann Arbor, Michigan, 1970), p. 13.
   Intercorrelations for this study appear to be much less of a
problem than expected.

TABLE II

REGRESSION RESULTS: DURATION OF UNEMPLOYMENT

Predictors	Value of b_i Coefficients	F Values	N
b_1	43.5		
Inc1	6.1	2.39	53
Inc2	3.8	2.32	152
Inc3	-0.5	1.43	856
Inc4 omitted	0		757
Inc5	0.2	2.52	604
Inc6	-3.0	2.98	442
Inc7	-5.8*	9.83	490
Sm	0.7	3.38	1,602
Sf omitted	0		1,752
Ag1	-11.9*	8.68	460
Ag2	-3.4	3.76	247
Ag3	0.7	0.375	1,399
Ag4 omitted	0		1,112
Ag5	6.7*	16.02	357
Ag6	15.2*	46.8	193
Ed1 omitted	0		1,635
Ed2	1.6	1.70	879
Ed3	0.6	0.199	840
Rw	1.2	1.14	2,014
Rm omitted	0		1,340
Ind1	-15.5*	37.6	1,151
Ind2	0.1	0.117	155
Ind3	-4.9	3.80	790
Ind4	3.6	1.50	298
Ind5	-4.1	1.20	88
Ind6 omitted	0		143
Ind7	6.8*	5.20	209
Ind8	-4.8	2.74	77
Ind9	1.8	0.383	227
Ind10	-2.1	0.45	216
Gr1	-17.5*	23.6	2,235
Gr2 omitted	0		1,031
Gr3	0.5	.287	88

*Indicates significance at the .05 level

R^2 = 0.202

estimates have been made, the significance of the net contribution of the factor can be tested in the manner shown in the footnote below.[11]

The procedure for obtaining the appropriate R^2 can be repeated for each factor one wishes to test. This is done by omitting each time the group of variables that represent the factor to be tested from the equation containing all other variables.

Through the use of the estimating procedure herein described, it was determined that income, age, industry, and the CLASP variable (Gr) were statistically significant at the .05 level. It should be noted that these factors all contain significant subclasses. Those factors that did not contain significant subclasses were all insignificant at the .05 level. Economic interpretation of the statistical results thus far presented will be reserved pending further analysis.

It seems appropriate here to point out that additional computations have been made so that the reader can interpret the regression coefficients in Table II as deviations from the overall mean rather than from the omitted classes. This alternative manner of presenting

---

[11] The test is an "F" statistic and the procedure has been presented and discussed in an article by Emanuel Melichar, "Least Squares Analysis of Economic Survey Data," American Statistical Association, 1965 Proceedings of the Business and Economic Statistics Section, pp. 380-381. The "F" formula is on p. 381, and is as follows:

$$F = \frac{(R_A^2 - R_B^2)\ (n - k_1 - k_2 - 1)}{(1 - R_A^2)\ (k_1)}$$ in which:

k_1 = number of independent variables representing factor A
k_2 = number of independent variables other than those representing factor A
n = number of observations
R_A^2 = coefficient of multiple determination for equation with $k_1 + k_2$ variables
R_B^2 = coefficient of multiple determination for equation with k_2 variables

the coefficients is presented and discussed in Appendix A. It is em-

phasized that even though the actual values of the coefficients differ,

the results of interest such as the deviations among the subclasses and

the significance tests are identical. Therefore it is at the option of

the reader to consider the material in Appendix A.

The degree of intercorrelation among predictors is often a major

consideration in interpreting statistical results. The correlation

coefficient matrix is presented in Appendix B. Slight intercorrela-

tions are observed among many of the predictors, but they are much

smaller than anticipated.

One approach that can be helpful in detecting intercorrelations

that mask the importance of certain variables is a stepwise multiple

regression procedure. The usefulness of the stepwise procedure for

this purpose will be clarified below. The discussion will now turn to

some basic features of stepwise analysis after which the operation will

be applied to the predictors under consideration.[12]

Stepwise Least Squares

It is emphasized that the stepwise procedure to be undertaken

is not what is often referred to as residual regression.

> It is a stepwise procedure in the sense that only one
> independent variable is entered into the regression equa-
> tion at a time. The potential of each independent variable
> to "explain" variation in the dependent variable is con-
> sidered, and the one which improves "goodness of fit" most
> is entered into the equation at any given step. This

---

[12]Henceforth, to avoid confusion the more conventional type of
least squares regression considered in the preceding section will be
referred to as "ordinary least squares" or o.l.s.

stepwise procedure is continued until no remaining inde-
pendent variable is effective in explaining a significant
amount of variation in the dependent variable at a pre-
scribed level of significance.[13]

All regression coefficients (b_i) are re-estimated at each step.

Therefore, any equation containing a given subset of predictors fitted

by this procedure is identical to the ordinary least squares equation

which contains the same subset of predictors.[14]

An F value is specified in advance for entering (and deleting)

a predictor, and as a result all predictors taken into account by this

form of analysis need not be entered into the final regression equation.

In fact, as demonstrated by the regression results in Table III, all

predictors that are not statistically significant at the prescribed

level of .05 are automatically omitted from the final equation. Each

X_i that corresponds to the predictors included in the equation takes

on the value of unity and all other X_i take the value of zero.

The fact that certain predictors are automatically excluded

from the final equation when no significant amount of variation remains

---

[13]Preston E. LaFerney, "Stepwise Regression with Dummy Variables:
A Handy Application of Least Squares Analysis" (unpub. manuscript, 1967),
p. 3.
    The mathematical foundation for the procedure under discussion
has been developed in detail by M. A. Efroymson, "Multiple Regression
Analysis," Mathematical Methods for Digital Computers [Anthony Ralston
and Herbert S. Wilf, eds.], (New York, 1960), pp. 191-203.

[14]There is apparently some confusion between the stepwise regres-
sion analysis under consideration and what is commonly referred to as
residual regression. Therefore it is thought that certain differences
in the two procedures should be clearly distinguished. Residual regres-
sion also considers each predictor in a stepwise fashion, but as long
as there is any degree of intercorrelation between the first predictor
(X_i) to enter the equation and the other X_i, it has the serious disad-
vantage of underestimating all regression coefficients (b_i) except the
first one.

TABLE III

REGRESSION RESULTS: DURATION OF UNEMPLOYMENT

Predictors	Value of b_i Coefficients	F Values	N
b_1	45.2		
Inc6	-3.2	4.21	442
Inc7	-5.7	7.28	490
Ag1	-11.8	7.78	460
Ag2	-3.8	4.22	247
Ag5	6.5	18.61	357
Ag6	15.7	64.85	193
Ind1	-15.0	151.50	1,151
Ind3	-4.6	12.70	790
Ind4	4.5	4.31	298
Ind7	7.8	26.61	209
Gr1	17.9	472.13	2,235

$R^2 = 0.198$

"F" values for coefficients are computed at the step in which the co-
efficients entered the equation. However, all are significant at at
least the .05 level in the final equation.

to be explained by their inclusion can be very useful in detecting inter-

correlations that affect the magnitude and standard error of the pre-

dictors. For instance, when two predictors are intercorrelated, it is

possible that neither of them will appear statistically significant if

both are entered in the same equation; whereas, one or even both may be

significant when the other is dropped.[15]

---

[15]For example: Suppose that predictors A and D are intercorrelated
and the corresponding coefficients are statistically insignificant when
the "ordinary least squares" equation is estimated. Further assume,
however, that when the stepwise method is used, the D predictor is ex-
cluded from the final equation and as a consequence, the A coefficient
is statistically significant.

Of course this procedure does not necessarily insure that D would
not be significant in the absence of A. To ascertain the coefficient of

The results of the <u>final</u> stepwise equation are shown in Table III. The predictors taken into account are the same ones listed in Table I. Only those predictors (for which $X_i = 1$) that are significant at the .05 level are included in the final equation. All other predictors fall into the omitted classes for which such $X_i = 0$. Thus $b_1 = 45.2$ is the estimated duration for the insignificant variables.

Comparing the stepwise results with those generated by the ordinary least squares procedure (hereinafter abbreviated o.l.s.) it is observed that Inc6, Ag2, and Ind3, and Ind4 are statistically significant for the first time. It should be noted that the change in magnitude for these regression coefficients was slight; however, the smaller F values in the preceding o.l.s. equation does suggest that intercorrelations are sufficiently prevalent to affect the statistical significance of these particular subclasses.

Further comparison of the o.l.s. and stepwise results does not indicate that the significance of education, sex, or race predictors were masked by intercorrelations. This matter was further considered by observing that none of these predictors entered the stepwise <u>equations</u> at any of the earlier <u>steps</u>.

In the next section an interpretation of the preceding <u>statistical</u> results will be undertaken. Some additional regressions that are not shown will be considered where it seems appropriate to do so.

D in the absence of A, one would have to delete A entirely from the estimating procedure.

Interpretation of Results

The interpretation of regression results will not be confined entirely to the question of statistical significance between the regression coefficients. Using o.l.s. multiple regression analysis, the deviation of each predictor coefficient is measured as the deviation from its corresponding omitted class. Where there are only two subclasses in a group--such as race or sex--we can readily determine whether or not the predictors are significantly different from each other. However, when there are more than two mutually exclusive subclasses within a group, the statistical significance of the deviation between each is not always apparent. For instance, for the o.l.s. results, Inc1 and Inc6 have opposite signs, the difference being 9.1 days; but neither is significantly different from the omitted class, Inc4.[16]

Therefore, in interpreting the regression results, the discussion will not eliminate all statistically insignificant predictors from consideration. Differences in the signs, magnitudes and patterns of divergence of the regression coefficients will be taken into account in this section. However, caution will be exercised.

Inc1 and Inc2 have positive signs, the magnitude of Inc1 being the greater. While this is consistent with predictions, it must be noted that the coefficients are not significantly different from the omitted class. Moreover, neither regression result indicates a

---

[16]Of course, the proportion of predictors of a discrete explanatory variable that are significant is often related to the way the subclasses have been contrived.

significant difference in duration for Inc3 or Inc5, and the variation

that is observed between these groups is extremely small. This small

difference is somewhat surprising.

Of course, average skill level for those earning from 95 to 120

(Inc5) per week is not "high" in relation to the labor force as a whole.

But as compared to the Inc3 group--among which many earned less than

the statutory minimum wage--it seems reasonable to presume that the

difference in average skill level is of considerable magnitude.

In general the queueing effect seems apparent but may be some-

what obscured by what Piore has referred to as the secondary labor

market phenomenon. Therein may be the explanation for the results

regarding Inc3 and Inc5, as well as the statistical insignificance of

Inc1 and Inc2.

Inc7 was significant when o.l.s. analysis was used and both

Inc7 and Inc6 were significant as a result of the stepwise procedure.

The magnitude of the Inc7 coefficient is also the greater of the two.

Regarding the o.l.s. results, duration for Inc7 was approximately

1-1/2 weeks shorter than for Inc4 (the omitted class) and 3 weeks

shorter than Inc1.

Thus, a negative relation is observed between income classes

and duration. However, the estimated relation is more explicit toward

the upper end of the scale, rather than at or near the bottom. More

emphatic results regarding the low skill-duration relation might be

possible if future studies are able to use time series data that include

periods of lower economic activity.

From the o.l.s. results three categories of age are observed to

be statistically significant, but the Ag1 and Ag2 coefficients are

negative rather than positive. Perhaps many among the younger groups
are not occupationally set and are less selective as to the rate of
compensation they are willing to accept. Whatever the explanation,
the results do indicate that there were no relative lack of job oppor-
tunities "per se" among the younger age groups under study. However,
some caution may be warranted in generalizing these results to other
jobless youth. New entrants into the labor force were not included in
the sample, but the results might be quite different if such participants
were included.

No significant difference between Ag3 (24-25 years) and Ag4
(46-59 years) is observed, and the difference in magnitude of the
respective coefficients is extremely small. Perhaps these results
should not be regarded as unusual in view of the high rate of resource
utilization.

The older age groups that have positive coefficients are Ag5
and Ag6. It was emphasized in Chapter III that aspirations may have
an especially strong influence on the length of unemployment experienced
by some older workers. The hypothesis was that often the older partic-
ipant is displaced from a job of long tenure at a rate of pay higher
than prevailing opportunities, and once unemployed, it may be extremely
difficult to find comparable compensation. Moreover it was suggested
that they may be less disposed to accept a lower wage because of alter-
native sources of income, such as company pensions and social security
payments, a part of which may be contingent upon retirement from the
work force. Therefore some inferences as to the effect of aspirations
on duration for older workers will be attempted in Chapter V.

Industry association is indicated to be an important correlate of variation in the duration of unemployment. The o.l.s. regression revealed only two significant Ind coefficients; however, four Ind coefficients were significant when the stepwise procedure was used. These were apparel manufacturing and retail trade for the o.l.s. results and construction, "other" manufacturing, apparel manufacturing and retail trade for the stepwise results. No specific theoretical rationale is presented in this study as to why some industrial classifications were important while others were not.

To gain a better understanding of these relations would require a detailed study of structural conditions in the New York labor market at the time of the CLASP experiment. And, of course, the use of such specific information for the purpose of generalizing to other labor market areas would seem to be limited. Nevertheless these results do suggest that future studies should whenever possible, take cognizance of the ad hoc economic conditions that exist in the area of interest.

The Gr1 coefficient is significant, and duration for this group was over 4 weeks shorter than for the Gr2 and Gr3 groups. This observation further suggests the importance of knowing the "special" circumstances of the unemployed individual. Specifically these results indicate that the individual's subjective evaluation of his prospects for re-employment is relevant for prediction purposes.

It has been stated that all of the Gr1 group expected to be re-employed within 10 weeks, and many expected to be recalled to former jobs or return to similar types of work. As pointed out earlier in the chapter, the effect of actual recalls on duration is not known because records do not indicate which participants actually returned to their

former jobs. Some evidence may, however, be inferred from a recent study of the correlates of duration in the Cleveland, Ohio and the Pittsburgh, Pennsylvania areas. The researcher found that approximately 60% of the sample expected to be recalled to former jobs, but only about 10% actually were. In spite of the fact that the majority of the participants were not re-employed at old jobs, they did on the average experience a considerably shorter duration than the other persons under study.[17]

Therefore it is suggested that future studies of duration take into consideration the job seeker's subjective evaluation of his chances for re-employment. In so doing the researcher should also attempt to discover the underlying reasons for the participant's expectations. Therein may be important clues to the correlates of duration.

None of the education predictors are observed to be significant as a result of the stepwise or o.l.s. procedures. The fact that persons identified by the lowest level of education did not experience a longer duration is particularly surprising. Moreover, regarding the o.l.s. results, Ed2 and Ed3 are observed to have experienced a slightly longer duration than Ed1; but the differences are especially small.

Because these results were clearly unexpected, two additional regressions not shown were undertaken. In both cases changes in the sample composition were made. For one o.l.s. regression the CLASP test group was combined with the control group that has been under

---

[17]David W. Stevens, "Duration of Unemployment: Theory and Evidence" (unpub. paper presented to Western Economic Association Meetings, Vancouver British Columbia, August 31, 1971). Professor Stevens tentatively suggests that expectations of recall might be regarded as an index of employability. His paper is presently undergoing revision.

consideration. This approximately doubled the sample size.[18] The regression results pertaining to education were practically identical, none being significant.

In a stepwise regression the test and control groups were also combined, but all Gr1 participants were excluded. In this instance Ed2 was statistically significant and positive; but the difference was only 3.9 days--a duration of approximately one week longer than the omitted classes.[19]

Thus, for the labor market and time period under study, these results indicate that there was no relative lack of job opportunities per se for those with little formal education. The very meager bit of evidence of a duration-education relation is observed for Ed2 rather than the lowest level, Ed1. This, of course, implies higher aspirations--relative to qualifications for Ed2. More emphatic conclusions may be drawn from future studies if new labor force entrants are included in the sample. It is also suggested that future research consider periods of lower economic activity before the education-duration hypothesis be rejected.

The fact that minority groups did not experience longer duration is not necessarily surprising. As emphasized on page 39, job discrimination is alleged to be less prevalent in the urban north than elsewhere; and, federal as well as New York state legislation prohibiting job

---

[18]It should be recalled that the test and control participants were apparently homogeneous in characteristics but differed in treatment.

[19]Recall, the stepwise procedure excludes all insignificant predictors from the final equation.

discrimination had been in effect for several years prior to the CLASP experiment.[20]

It was noted earlier that CLASP recorded race according to white non-Spanish surname; white-Spanish surname; black-Spanish surname; and black non-Spanish surname. In the regressions shown, all blacks and those with Spanish surnames were classified into the minority subclass. In a regression not shown, the minority groups were subdivided into the four latter groups described above, but even then none of the minority coefficients were statistically significant.

The estimated difference in duration attributable to sex was very slight and statistically insigificant. It was noticed that Sf and Indl were somewhat intercorrelated (0.312) and that the Indl regression coefficient had an especially large negative sign. Thus, it was thought that the Sf coefficient might have been influenced by its association with Indl. Therefore, to determine if "other" females experienced a substantially longer duration than that indicated in Table II, an additional o.l.s. regression not shown was undertaken. The regression equation included those predictors previously considered and two interaction terms. These terms represented females previously employed in Indl-SfIndl-and all females not associated with Indl-SfInd2...10. The estimated coefficient for SfInd2...10 was only one day greater than for males, which was not statistically significant. Therefore, it appears that prior estimates for Sf were largely net of the effects of intercorrelation with Indl.

---

[20]As reiterated in regard to other predictors, the high level of demand and the fact that only the recently employed are included in the sample, may also be major factors in the results regarding minority groups.

It was previously suggested in a latter section of Chapter II that considerable randomness or chance may affect the time-span of job search. The rather modest R^2's for the regression results of this chapter may indicate randomness, but may also indicate that important variables are missing from our estimating equations. Of course, no claims have been made that all relevant variables were included.

The study is a cross section analysis and as a result changes in aggregate demand within the New York area could have been of some consequence to the R^2 values. Probably more important was the fact that we were unable to consider _changes_ in economic conditions among specific industries. Moreover the estimates did not include certain factors that have been hypothesized to affect aspirations. The relevance of economic conditions and wage aspirations to the variation in the duration of unemployment as well as the extent of stochastic variation is a matter for future research.

CHAPTER V

INTERACTIONS AND THE ASPIRATION PROBLEM

This chapter is composed of two major sections. The first consists of a statistical analysis of specific interaction terms and a discussion of the results. The next section will make additional inferences regarding aspirations by estimating the relation between personal characteristics and the incidence of being declared ineligible for the receipt of further unemployment compensation.

Interactions

In the preceding chapter additivity was of course assumed for the predictors. It will be recalled that in Chapter III reference was made to the possibility of interactions among some of the predictors. On page 31 of Chapter III, it was stated that ". . . in a tight labor market some factors indicative of disadvantaged status may contribute to longer than average periods of search only when they exist in combination with one or more other disadvantaged factors." Such factors among the duration predictors would of course be the joint presence of some combinations of low levels of income, low education achievement, certain age groups and possibly minority status.

This possibility was explored through regression analysis by specifying a large number of combination predictors which included the factors just mentioned. A number of interaction predictors are significant which

would seem to be of interest. However, no clearly defined pattern appears

discernible for participants identified by joint combinations of the so-

called disadvantaged factors. These results are presented and discussed

below.

The interaction terms for the regression shown in this section

consist of two-way combinations of the income, sex, age, education, and

race predictors. These product terms were formed by combining each pre-

dictor of a given group with each other predictor of the other groups.

Specifically:

> (1) Each income subclass was combined with each of the
> sex, age, education, and race subclasses to form 131 interaction
> predictors.
> (2) Male and female were each combined with each of
> the age, education, and race subclasses to form 22 interaction
> terms.
> (3) The age subclasses were combined with the education
> and race subclasses to form 30 interaction terms.
> (4) Last the three levels of education were combined
> with each race subclass to form six interaction terms.
> In addition, all predictors shown in Table I are taken
> into account.

For reasons to be explained below the stepwise procedure was

chosen. This particular technique was explained and used in the pre-

ceding chapter. The reader is reminded that only those variables that

are able to explain a significant amount of variation in the dependent

variable are entered in the final equation. It was therefore not

necessary to constrain any of the variables to zero because all pre-

dictors that are not significant at the .05 level are excluded from the

final equation and automatically take the value of zero. The predictors

that were significant at the .05 level are listed in Table IV. They

are listed in the order by which they are discussed.

Before discussing these results, certain limitations of multiple regression techniques which include large numbers of dummy predictors will be pointed out. Whenever the number of predictors is large, Sonquist, et al. have explained that ". . . it is almost certain that terms will be inserted in the model which really explain only variation idiosyncratic to the model . . .,"[1] i.e., where there are so many variables some could easily fit the data and simply be explaining sampling variation. In order to avert as much of the occurrence of sampling error as possible, the stepwise technique was used. This, of course, should ameliorate the problem somewhat, but it does not dispense with it. Therefore the following interpretation should be regarded as tentative.

As mentioned above, the regression results do not seem to indicate a general pattern of increasingly longer duration as a result of the combined presence of so-called disadvantaged characteristics. One such group (EdlIncl) did experience a longer duration by an estimated 21 days, but for other disadvantaged combinations, including the low education-income combinations, longer duration is not indicated.

Moreover, for racial groups, a somewhat longer duration is observed for white lower and middle Inc groups rather than for minorities. These are RwInc2, RwInc4, and RwInc5. This may imply that low skilled

---

[1] John A. Sonquist, *Multivariate Model Building, The Validation of a Search Strategy* (Ann Arbor, Michigan, 1970), p. 13. Furthermore, according to Sonquist, "even the most adequate methods presently used for dealing with interaction effects have the disadvantage that they require considerable a priori knowledge, since one must somehow build the terms into the model without knowing how many cases there are for which they could be relevant, or without knowing what kind of terms to use in order to provide an accurate representation of the joint effects."

TABLE IV

INTERACTION REGRESSION RESULTS:
DURATION OF UNEMPLOYMENT

Predictors	Value of b_i Coefficients	F Values	N
b_1	44.2		
Ed1Inc1	21.1	11.93	30
RwInc2	9.0	9.0	85
RwInc4	3.8	8.3	376
RwInc5	2.7	5.1	409
RmInc6	5.6	4.3	110
RwInc7	-10.0	10.7	408
Ag5Inc7	11.4	6.4	80
Ag6Inc4	12.4	5.3	37
Ag6Inc7	18.8	5.0	22
Ag6Sm	12.5	70.0	123
Ed3Inc6	- 9.8	7.0	128
Ed2Inc7	7.9	5.4	116
Ed3Ag2	- 8.1	7.4	109
Ed3Ag5	10.6	10.6	38
Ed3Rw	4.2	5.3	525
RwAg1	-23.0	9.6	190
Ag3Inc1	-16.9	4.5	14
Ag4Inc4	- 8.1	8.2	224
Ind1	-15	151.2	1,151
Ind3	- 4.6	11.31	790
Ind7	6.5	25.6	209
Gr1	-17.3	472.6	2,236

$R^2 = 0.220$

"F" Values for coefficients are computed at the step in which the coefficients entered the equation. However all are significant at at least the .05 level in the final equation.

whites, on the average, had higher aspirations than low skilled minorities. However, the meager bit of evidence which exists for upper Inc racial groups indicates an opposite relation. RmInc6 experienced a longer duration by 5.6 days, and whites in the Inc7 group (RwInc7) experienced a shorter duration by 9.9 days.

For those older-aged Inc groups that are significant, the indication is for longer duration for the upper Inc as compared to the lower. Ag5Inc7 is the only significant Ag5Inc category and the coefficient is +11.4 days. This value is higher than the estimate for Ag5 in the additive regressions shown in Chapter IV. Also the Ag6Inc7 coefficient is +18.8 days which is greater than the Ag6Inc4 (the value being +12.4 days); and Ag6Inc7 is greater than the Ag6 coefficient in the additive model. These observations for the older groups are consistent with the hypothesis that the upper Inc older workers may have previously been earning more than prevailing opportunities and may also be less disposed to accept lower wages.[2]

The Ag6Sm coefficient of +12.5 days is evidence that longer duration for the oldest age group is attributable to males in that group. Results pertaining to education will be discussed briefly. The estimated duration for Ed3Inc6 is -9.8 days. This is consistent with the idea that a greater array of jobs is available for the better educated upper skilled groups.[3] The Ed2Inc7 group has a positive coefficient of +7.9 days. This may indicate that higher skilled groups with

[2]No rationale for Ag3Inc1 or Ag4Inc4 is offered.

[3]Of course, the question arises as to why Ed3Inc7 was not significant and the answer may very well stem from the shortcoming of the statistical procedure.

less than a high school education have more difficulty in regaining high compensating jobs.

Ed3Ag2 is negative by -8.1 days indicating a shorter duration for the group than the earlier additive estimates indicate. This seems to simply suggest that better educated youths have less trouble finding desirable jobs. Ed3Ag5 is positive by +10.6. An explanation similar to that for the Ag5 upper Inc groups may be appropriate. The modestly positive coefficient for whites in the Ed3 category (Ed3Rw = +4.17 days) is somewhat surprising.

One interaction term that seems particularly of interest for future research is that of the youngest white group: RwAg1 = -23 days. This, of course, suggests that the youngest minority group experienced a considerably longer duration than the younger whites. If this estimate does portray the real situation, it is thus consistent with the presumption that teenage minorities have more difficulty finding work than teenage whites. Furthermore, the absolute length of unemployment as well as the variation between the two groups would be more meaningful if new labor force entrants were included in future studies.[4]

It is interesting to note that the only variables that entered the equation in single form are among the industry and CLASP group classifications. It is suspected that the high degree of intercorrelation between the interaction terms and their corresponding single form predictors was a factor in preventing single variables from entering the estimating equation at the prescribed level of significance.

---

[4]Interestingly, there were 190 whites in the youngest age category and only 27 minorities. Because a large proportion of the sample was made up of minorities, this suggests that many teenage minority persons in the area were not working.

The shortcomings of multiple regression analysis which involve such a large number of variables were emphasized above. Therefore these results and their interpretation should be regarded as tentative. However, questions and problems for future research are indicated.

A Surrogate Approach to the Aspiration Problem

This section will attempt to make more direct inferences regarding the relevance of aspirations to the duration of unemployment. The technique used is an o.l.s. regression equation which estimates the incidence of disqualifications among the income, sex, age, education, and race predictors. First we will describe the way in which the data were edited and then present the statistical results and an interpretation. Next, certain deductions will be made as to the relevance of these estimates to the earlier duration of unemployment estimates in Chapter IV.

The data were edited in the following way: The sample is composed of those persons in the control group who have been under consideration and also those control participants who received unemployment benefits for a time but were later declared ineligible for additional payments during their period of unemployment.[5] The rationale for this approach is based on the idea that a relatively higher incidence of disqualification for a group implies that a larger number of the group are not accepting work when work is available.

---

[5]It should be recalled that the latter group was excluded from the sample in Chapter IV.

According to New York state rules regarding unemployment insurance claimants, "You will be disqualified from receiving unemployment insurance if: . . . After applying for unemployment insurance, you refused, without good cause, a job for which you were fitted by training and experience."[6]

In the regression equation used to estimate the incidence of disqualification, the dependent variable Y is also in dummy form. Therefore, the value of Y is either unity or zero. Unity indicates the occurrence of disqualification and zero indicates the nonoccurrence. According to Johnston, "If we run a multiple regression of such a dependent variable Y on several explanatory variables X, then we may interpret the calculated value of Y, for a given X, as an estimate of the conditional probability of Y, given X."[7]

The results of this kind of regression for our sample are shown in Table V. The value b_i = 0.258 represents the incidence of disqualification for the omitted subclasses.[8] The other regression coefficients (b_i) are estimates of the differential occurrence of disqualification between each predictor of a discrete explanatory variable and its corresponding omitted class.[9] For instance, the estimated incidence of disqualification for persons identified by Inc6, Sm, Ag2, Ed3 and Rm is

---

[6]New York State Unemployment Insurance Information for Claimants, 1968-69, p. 16.

[7]J. Johnston, Econometric Methods (New York, 1960), p. 224.

[8]The overall mean probability is 0.249.

[9]As before, X_i = 0 for the omitted predictor of each discrete explanatory variable and other X_i = 1.

TABLE V

REGRESSION RESULTS: INCIDENCE OF DISQUALIFICATIONS

Predictors	Value of b_i Coefficients	F Values	N
b_1	.258		
Inc1	+0.139*	8.44	87
Inc2	+0.035	1.23	218
Inc3	+0.003	0.049	1,187
Inc4 omitted	0.0		1,053
Inc5	−0.02	1.08	805
Inc6	−0.059*	6.57	554
Inc7	−0.13*	28.8	563
Sm	+0.025	2.78	2,104
Sf omitted			2,363
Ag1	+0.184*	13.40	90
Ag2	+0.109*	12.30	418
Ag3	−0.014	0.348	1,878
Ag4	−0.033	1.93	1,380
Ag5 omitted	0.0		449
Ag6	+0.004	0.0159	252
Ed1	−0.059*	13.39	2,024
Ed2 omitted	0.0		1,218
Ed3	−0.048*	7.52	1,225
Rw omitted	0.0		2,572
Rm	+0.041*	7.62	1,895

*Indicates significance at .05 level

$R^2 = 0.047$

(3) $Y = 0.258 + 0.025 + 0.109 - 0.048 + 0.041$

$= 0.385.$

The incidence of disqualification is progressively higher for the lower Inc groups. This pattern suggests that a larger proportion of the lower skilled groups are reluctant to accept available jobs commensurate with qualifications. Moreover these results seem to imply that at least some portion of the longer duration earlier observed for low Inc groups

was attributable to higher job aspirations--relative to qualifications--
among the lower groups.

The coefficients for Ag1 and Ag2 are large and are highly sig-
nificant. This seems to further substantiate that there was no relative
lack of available jobs for the younger participants under study. The
differential pattern of disqualification is very small among the other
age groups and the F values are quite low, none being significant at
even the .10 level.[10]

Regarding education, the lowest and highest levels had the lower
incidence of disqualification. These observations therefore suggest
higher than average aspirations (relative to qualifications) for the
Ed2 groups. Because of prosperous economic conditions during the
CLASP experiment, many among the Ed2 groups may justifiably have had
reason for expecting to find better jobs than their previous ones.
Rising aspirations may of course be typical of most job seekers during
such periods. However, for those with very low levels of formal edu-
cation (Ed1) the prospect for improvement may be realistically assessed
as less promising.

This explanation is of course tentative. Whether or not evidence
of higher relative aspirations for Ed2 would be obtained during down-
turns in economic activity is a question for further research.

---

[10]If a strict interpretation of the aspiration concept is taken,
this does not prove that high aspirations (relative to qualifications)
were inconsequential to the earlier observed longer duration of older
workers. Since workers are required to take only jobs commensurate
with previous training and experience, many would not be compelled to
take "any" job to remain eligible for benefits. Assuming that the
older worker's alternative employment opportunities are typically lower
paying than his previous job, he could therefore refuse many available
jobs and still receive unemployment insurance.

Those identified by minority status had a somewhat higher and statistically significant incidence of disqualification than whites. This implies higher aspirations for minority groups, and may also suggest rising aspirations during periods of prosperity: If many participants of minority status had previously held jobs below their level of objective qualification, then they too may have reason to expect that better jobs are obtainable.

Males are observed to have experienced a slightly higher proportion of disqualifications than females. However the difference is not statistically significant.

This is, of course, an indirect or surrogate approach to the problem of aspirations. The very low R^2 obtained for the regression results in this section probably means that many important explanatory variables are missing. Some such factors as accumulated wealth and alternative sources of income were discussed in Chapter II. Even so, the results do suggest that aspirations are an important dimension of the variation in the duration of unemployment.

There may be other important ramifications of these results which are relevant to the observed predictor-duration relations in Chapter IV. If the total time span of unemployment for the participants that were disqualified were recorded and these persons had been incorporated in the sample for which estimates of duration were made, the average duration for the population sample would have been longer.[11] Moreover, it

---

[11]Provided that the recorded plus the unrecorded time span of duration for the disqualified participants was greater than the recorded (total) duration experienced by the non-disqualified participants. Computations were made which showed that the average recorded duration for the disqualified was slightly longer than recorded duration for others.

seems plausible to assume that the estimated _increase_ in duration would typically be greater for those predictor groups that had the greater incidence of disqualifications.[12]

The relevance of this proposition for specific duration-predictors will now be taken into account. Had total duration for disqualified persons been recorded and such persons been included in the duration estimates in Chapter IV, the observed differential in duration between the lower and higher Inc groups would apparently have been greater because the occurrence of disqualifications was progressively greater from Inc7 to Inc1.

Regarding the younger age groups, the substantially higher incidence of disqualification (for Ag1 and Ag2) implies that their shorter observed duration is in part explicable by the fact that many of those who presumably experienced longer duration were not included in the duration estimates.

The same kinds of inferences may, of course, be made for predictors of other groups. For the education, race, and sex predictors, the variation in the incidence of disqualification was less pronounced than for Inc and some Ag, and the variation in duration was small and insignificant. Even so, given that the hypothesized higher incidence-longer duration relation is applicable for these groups, we can infer that the duration estimates would have been somewhat longer for males, minority groups, and Ed2.

---

[12]The average expected increase in duration would tend to be greater for the higher incidence predictor groups because a larger number of people were yet to be employed. Also fewer persons in such groups are apparently as willing to take the more readily available jobs. The "greater increase" in duration is not, however, a foregone conclusion.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The purpose of this thesis has been to test the relation between certain personal characteristics and the duration of unemployment for a particular sample group. The theoretical framework in Chapter II hypothesized that duration was a function of the job seeker's relative attractiveness to employers and the wage that he was willing to accept. For those job seekers identified by certain characteristics near the bottom of the queue, it was specifically hypothesized that they would have a more limited array of jobs from which to choose and were thereby expected to experience a longer duration.

From a given sample, we have identified certain personal characteristics that were associated with longer periods of unemployment, but we have not determined conclusively when longer duration was caused by limited job opportunities or a lack of attractive jobs. However, in view of the findings presented in Chapters IV and V, it seems evident that during high levels of market activity, the threshold of wage aspirations relative to one's objective and subjective qualifications are a major cause of the variation in the duration of unemployment. Specifically regarding the so-called disadvantaged groups in our study, there appears to be considerable evidence that longer duration was at least partially explicable by relatively higher aspirations.

It has been suggested that the interaction analysis should be re-
garded as tentative. However, one thing that seemed especially evident
from the interaction results was that there was no apparent pattern of
increasingly longer duration for persons identified by the joint presence
of more than one disadvantaged characteristic.

As indicated above, a major empirical effort of this thesis has
been to identify more clearly those factors associated with longer dura-
tion. As a result of the empirical analysis in Chapter IV, it was found
that age and income--a proxy for skill--were significantly related to
the variation in duration, but little difference was observed for race,
education, and sex.

The small estimated differences in duration obtained for sex and
race were not especially unanticipated. We did, however, infer from
the empirical results regarding disqualifications that the variation
in duration by race, education, and sex might have been somewhat greater
had our earlier duration estimates been able to include those that were
disqualified from receiving unemployment compensation.

As emphasized in Chapter IV, additional research from other popu-
lation samples that would include non-unemployment insurance benefici-
aries and for different levels of economic activity should more clearly
establish the relation of personal characteristics to the variation in
the time spent looking for work. Regarding economic activity, at lower
levels of employment, the queueing of participants at the end of the job
ladder (or job ladders) would seem to be more apparent and the variation
in duration more pronounced than was obtained from the statistical results
in Chapters IV and V. With respect to race, it seems particularly obvious
to also recommend studies in other parts of the country.

As earlier indicated, one of the surprises was that there was little apparent relation between the level of education and the duration of unemployment. The scant bit of evidence obtained regarding a duration-education relation was that the middle group experienced a slightly longer duration than the eighth grade and under group. It is suggested that the real importance of such findings is that low education was not an apparent handicap to finding employment for the group of unemployment beneficiaries under study.

Ex post facto, one might surmise that once a person has established some degree of occupational competence through job experience, that formal education achievement becomes much less of a requisite for many kinds of jobs. However, the relevance of these ideas regarding the observed education-duration relation should probably not be regarded as conclusive pending additional research. Perhaps during less prosperous periods there would be a bumping back of the middle group for the lower compensating jobs that the least educated had previously been able to obtain easily.

Regarding age groups, the general pattern was a positive relation between duration and age. These findings were as expected for the older groups, but the estimates for the two youngest groups were the opposite in sign from what had been predicted. In generalizing these results (for the young) to other labor markets some reservation may be in order for the reason that all had recently been employed. However, the rather large negative duration coefficient for the youngest group and the high incidence of disqualification for other "young" participants suggests no lack of employment opportunities for at least many of them. This evidence is consistent with the observed high incidence of

unemployment for the young job seeker on the national level and it implies
that high aspirations are the cause.

Caution is suggested before reaching the conclusion of plentiful
jobs for the young person of minority status. It should be recalled
that a rather large proportion of the entire sample were non-white but
only a small percentage of the teenage group were of minority status.
This of course implies lower labor force participation for the non-white
youths in the labor market area under consideration, and the cause may
be one of limited job opportunities.

Skill level as measured by recent earnings followed the predicted
pattern even though the difference in duration between the upper and lower
groups was not exceptionally large. At lower levels of economic activity
the difference might of course be greater. The fact that a pattern
toward shorter duration was explicit toward the upper end of the income
scale may simply indicate an increasingly wider (generally a linear rela-
tionship) number of job opportunities for the higher skilled groups.

The fact that the incidence of disqualification was progressively
higher for the lower income groups suggests a longer duration for lower
skilled groups than was obtained from our duration estimates. These
same results also seem to indicate that much of the unemployment observed
for the low skilled groups on the national level is related to the fact
that many such persons are unwilling to take the kinds of jobs that
are more readily available.

BIBLIOGRAPHY

Alchian, Armen A. "Information Costs, Pricing and Resource Allocation."
    Western Economic Journal, VI (June, 1969), pp. 109-128.

Bowen, William G. and T. Aldrich Finegan. The Economics of Labor Force
    Participation. Princeton: Princeton University Press, 1969.

Caine, Edward M. "Improving Employability of U. I. Claimants." Unem-
    ployment Insurance Review (December, 1967), pp. 1-3.

Gilman, H. J. "Economic Discrimination and Unemployment." American
    Economic Review, LV (December, 1965), pp. 1077-1096.

Goldberger, Arthur S. Econometric Theory. New York: John Wiley and
    Sons, 1964.

Holt, Charles C. and Martin H. David. "The Concept of Job Vacancies in
    a Dynamic Theory of the Labor Market." The Measurement and Inter-
    pretation of Job Vacancies. Compiled by the National Bureau of
    Economic Research. New York: Columbia University Press, 1966.

Johnston, J. Econometric Methods. New York: McGraw-Hill, 1960.

LaFerney, Preston E. "Stepwise Regression with Dummy Variables: A
    Handy Application of Least Squares Analysis." (unpublished paper
    from Washington, D.C., 1967).

Melichar, Emanuel. "Least Squares Analysis of Economic Survey Data."
    1965 Proceedings of the Business and Economics Section of the
    American Statistical Association. Philadelphia, 1965, pp. 373-385.

Mincer, Jacob. "On-the-job-training: Costs, Returns and Some Implica-
    tions." The Journal of Political Economy, LXX Supplement (October,
    1962), pp. 51-73.

Mortenson, Dale. "Job Search, the Duration of Unemployment and the
    Phillips Curve." The American Economic Review, LX (December, 1970),
    pp. 847-862.

New York Department of Labor, Division of Employment. CLASP: Report on
    Research Findings Based on the Experimental Advisory Service Pro-
    gram for Unemployment Insurance Claimants, Operations Study Number 3,
    April, 1970.

New York Department of Labor, Division of Employment. New York State
    Unemployment Insurance Information for Claimants 1967-68, 1967-68.

Oi, Walter Y. "Labor as a Quasi-Fixed Factor." Journal of Political Economy, LXX (December, 1962), pp. 538-555.

Piore, Michael J. "Public and Private Responsibilities in On-the-Job Training of Disadvantaged Workers." (unpublished manuscript from M.I.T., 1968).

Reder, Melvin W. "Wage Structure and Structural Unemployment." Review of Economic Studies, XXXI (October, 1964), pp. 309-322.

Sobel, I., and H. Folk. "Labor Market Adjustments by Unemployed Older Workers." Employment Policy and the Labor Market. Edited by A. M. Ross. Berkeley, California: University of California Press, 1965.

Sonquist, John A. Multivariate Model Building. The Validation of a Search Strategy. Ann Arbor, Michigan: University of Michigan Press, 1970.

Stevens, David W. "Duration of Unemployment: Theory and Evidence." Paper presented to Western Economic Association Meeting, Vancouver, British Columbia, August 31, 1971.

Stigler, George J. "Information in the Labor Market." Journal of Political Economy, LXX Supplement (October, 1962), pp. 94-105.

Suits, Daniel B., and Richard D. Morgenstern. "Duration as a Dimension of Unemployment." (unpublished manuscript from the University of Michigan, December, 1967).

Thurow, Lester C. "The Occupational Distribution of the Returns to Education and Experience for Whites and Negroes." The American Statistical Association, Social Statistics Section Proceedings, 1967, pp. 233-243.

Thurow, Lester C. Poverty and Discrimination. Washington, D.C.: Brookings Inst., 1969.

U.S. Department of Labor, Bureau of Labor Statistics. February, 1969, p. 80.

U.S. Department of Labor/Manpower Administration. "Hiring Standards and Job Performance." Manpower Research Monograph #18. Washington, D.C.: Government Printing Office, 1970.

Wilcock, R. C., and W. H. Franke. Unwanted Workers, Permanent Layoffs and Long Term Unemployment. Glencoe, Illinois: The Free Press, 1963,

APPENDIX A

For ease in interpretation, some readers may prefer to view the
regression coefficients shown in Table II as deviations from the overall
mean rather than from a particular base (omitted) class. Melichar has
shown the additional computations that are necessary to translate the
b_i to the alternative form.[1] These computations have been made and re-
sults are presented in Table VI. For each b_i coefficient, this latter
presentation format should be interpreted as an estimate of the net dif-
ference in duration between a given predictor of a group and the overall
mean.

It will be noted that the values of the coefficients differ from
those earlier shown in Table II. However it is emphasized that the re-
sults obtained are in both instances identical. According to Melichar,
they are identical

> . . . because the results of interest are the differences
> among the coefficients, and these differences are the same
> regardless of the method used . . . . Identical values are
> also obtained for measures of importance and statistical sig-
> nificance. Thus the only difference between the two methods
> is the form in which the coefficients are presented to the
> audience.[2]

Because the results are identical, the estimated duration for
a person identified by the same characteristics are the same (except

---

[1] Emanuel Melichar, "Least Squares Analysis of Economic Survey
Data," American Statistical Association, 1965 Proceedings of the Busi-
ness and Economic Statistics Section, pp. 374-375.

[2] Ibid., p. 375.

for fractional differences due to rounding) using either method. This is illustrated for a person identified by equation 2, page 51. Using the results in Table VI, the estimated duration for such a person is computed by a summation of the appropriate regression coefficients with the overall mean:

(4) $Y = \overline{Y} + Inc7 + Sm + Ag2 + Ed2 + Rw + Ind7 + Gr1$; substituting

   $Y = 27.2 - 4.8 + 0.4 - 4.9 + 1.0 + 0.5 + 12.8 - 5.9$

     $= 27$ days

TABLE VI

REGRESSION RESULTS: DURATION OF UNEMPLOYMENT AS
DEVIATION FROM OVERALL MEAN

Mean Duration 27.2

Predictors	Value of b_i Coefficients	F Values	N
Inc1	7.2	2.39	53
Inc2	4.8	2.32	152
Inc3	0.5	1.43	856
Inc4	1.1		
Inc5	1.3	2.52	604
Inc6	-1.9	2.98	442
Inc7	-4.8*	9.83	490
Sm	0.4	3.38	1,602
Sf	-0.3		
Ag1	-13.4*	8.68	460
Ag2	-4.9	3.76	247
Ag3	0.8	0.375	1,399
Ag4	1.4		
Ag5	5.3*	16.02	357
Ag6	13.7*	46.8	193
Ed1	-0.6		
Ed2	1.0	1.70	879
Ed3	0.02	0.199	840
Rw	0.5	1.14	2,014
Rm	-0.7		
Ind1	-9.6*	37.6	1,151
Ind2	6.1	0.117	155
Ind3	1.0	3.80	790
Ind4	9.5	1.50	298
Ind5	1.9	1.20	88
Ind6	6.0		143
Ind7	12.8*	5.20	209
Ind8	1.1	2.74	77
Ind9	7.8	0.383	227
Ind10	3.9	0.45	216
Gr1	-5.9*	23.6	2,235
Gr2	11.7		1,031
Gr3	12.2	0.287	88

*indicates significance at the .05 level

$R^2 = 0.202$

TABLE VII

SIMPLE CORRELATION COEFFICIENT MATRIX FOR PREDICTORS LISTED IN TABLE I

	Sm	Sf	Ag1	Ag2	Ag3	Ag4	Ag5	Ag6	Ed1	Ed2	Ed3	Rw	Rm	Ind1	Ind2	Ind3	Ind4	Ind5	Ind6	Ind7	Ind8	Ind9	Ind10	Gr1	Gr2	Gr3
Inc1	(-).035	.035	(-).006	(-).027	(-).039	.033	.018	.154	(-).012	.037	.015	(-).054	(-).054	(-).026	(-).005	(-).031	.031	.020	.032	.076	.013	.032	.015	(-).052	(-).05	.009
Inc2	(-).151	.151	.024	(-).012	(-).033	.011	(-).024	.082	.006	(-).023	(-).030	.018	.018	(-).072	(-).014	(-).033	(-).058	(-).027	.032	(-).001	.014	.027	.005	(-).016	(-).002	(-).054
Inc3	(-).324	.324	.060	.089	(-).019	(-).033	.056	.030	.049	.032	(-).089	.215	(-).215	.048	.015	(-).149	(-).166	.070	.032	.001	.053	.016	.023	(-).028	(-).048	.054
Inc4	(-).099	.099	(-).010	(-).042	(-).057	(-).041	.052	(-).020	(-).051	.043	.016	.114	(-).114	.018	.020	(-).023	(-).011	.057	.049	(-).014	.022	.011	.005	(-).037	.028	(-).027
Inc5	(-).066	(-).066	(-).022	(-).010	.011	(-).023	.001	(-).001	(-).010	.015	.026	.073	(-).073	.008	(-).004	.021	.070	(-).015	(-).020	.024	(-).015	(-).010	.048	.024	(-).033	(-).024
Inc6	.176	.176	.031	.059	.020	.029	.066	.021	.017	.054	.035	.122	.122	.031	.023	.040	.092	.063	.008	.024	.064	.024	.023	.005	.014	.053
Inc7	.379	.379	.049	.075	.026	.042	.076	.023	.015	.024	.042	.196	.196	.093	.023	.120	.369	.101	.025	.061	.001	.007	.002	.058	.040	.057
Sm			.005	.018	.008	.076	.055	.079	.003	.008	.011	.040	.040	.312	.097	.079	.312	.119	.049	.097	.069	.013	.026	.112	.113	.004
Sf			.005	.018	.008	.076	.055	.079	.003	.008	.011	.040	.040	.312	.097	.079	.312	.119	.049	.097	.069	.013	.026	.112	.113	.004
Ag1				.033	.100	.083	.041	.029	.054	.029	.032	.045	.045	.015	.011	.001	.037	.019	.051	.020	.001	.040	.011	.047	.038	.029
Ag2					.239	.199	.097	.070	.177	.079	.124	.108	.108	.103	.014	.080	.036	.011	.059	.021	.041	.038	.009	.127	.097	.097
Ag3						.224	.116	.140	.321	.107	.059	.069	.016	.058	.019	.028	.028	.025	.011	.020	.034	.026	.024			
Ag4							.156	.073	.106			.196	.196	.105	.043	.039	.009	.024	.030	.006	.032	.021	.022	.091	.068	.072
Ag5								.174	.085	.115		.189	.189	.074	.025	.078	.032	.026	.039	.027	.031	.005	.016	.031	.023	.026
Ag6									.154	.090	.087	.178	.178	.040	.024	.056	.037	.041	.021	.069	.031	.010	.030	.012	.015	.008
Ed1												.067	.067	.148	.064	.014	.035	.093	.099	.0003	.042	.116	.010	.171	.157	.048
Ed2												.105	.105	.031	.037	.021	.026	.005	.029	.022	.028	.023	.004	.008	.015	.021
Ed3												.029	.029	.140	.037	.038	.067	.112	.086	.022	.077	.157	.008	.204	.197	.034
Rw														.104	.076	.147	.024	.004	.006	.057	.056	.021	.019	.026	.009	.049
Rm														.104	.076	.147	.024	.004	.006	.057	.056	.021	.019	.026	.009	.049
Ind1																							.019	.309	.290	.075
Ind2																							.058	.052	.044	.026
Ind3																							.146	.007	.017	.028
Ind4																							.082	.045	.033	.038
Ind5																							.043	.026	.024	.008
Ind6																							.055	.114	.112	.012
Ind7																							.068	.152	.146	.027
Ind8																							.040	.162	.152	.037
Ind9																							.071	.202	.196	.030
Ind10																								.051	.044	.025

VITA ∂

James Nye Mangum

Candidate for the Degree of

Doctor of Philosophy

Thesis: AN EMPIRICAL ANALYSIS OF THE RELATION BETWEEN PERSONAL ATTRI-
BUTES AND THE DURATION OF UNEMPLOYMENT

Major Field: Economics

Biographical:

Personal Data: Born in Big Sandy, Texas, December 5, 1933, the son
of Mr. and Mrs. J. Nye Mangum.

Education: Received the B.A. degree from North Texas State Univer-
sity in 1959 with a major in Economics; received the Master
of Arts degree from North Texas State University in 1965;
completed requirements for the Doctor of Philosophy Degree
at Oklahoma State University in May, 1973.

Professional Experience: Served as part-time instructor at North
Texas State University in 1959 and 1960; employed as Sales
Manager for American Automobile Association from 1961 to 1964;
employed as instructor of Economics at Northeastern State
College, Tahlequah, Oklahoma, in 1964 and 1965; employed
at East Central College, Ada, Oklahoma, as Assistant Pro-
fessor of Economics, from 1965 to 1967; served as graduate
assistant and instructor of Economics at Oklahoma State
University from 1967 to 1970; employed as Associate Professor
of Economics at Louisiana Tech University in Ruston, Louisiana,
from 1970 to present.

Organizations: Omicron Delta Epsilon, Delta Sigma Pi.