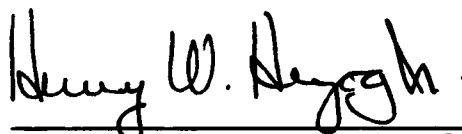


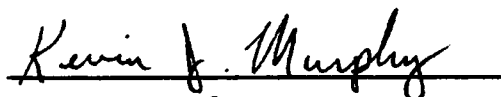
To the Graduate Council:

I am submitting herewith a dissertation written by Ernest Preston Goss entitled "The Internal Labor Market--Its Effects on Occupational and Geographic Mobility." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Economics.

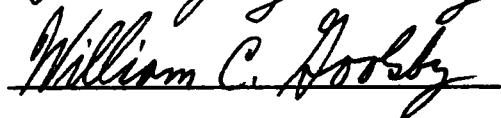


Henry W. Herzog, Major Professor

We have read this dissertation
and recommend its acceptance:







Accepted for the Council:



The Graduate School

THE INTERNAL LABOR MARKET--ITS EFFECT ON OCCUPATIONAL
AND GEOGRAPHIC MOBILITY

A Dissertation
Presented for the
Doctor of Philosophy
Degree

The University of Tennessee, Knoxville

Ernest Preston Goss

December 1983

ACKNOWLEDGEMENTS

I shall be forever indebted to the four members of my dissertation committee for their selfless contributions to the production of this thesis. Professors Chang, Goolsby, Herzog and Murphy provided unique insights into the research process. Professor Herzog and Professor Murphy, as co-chairmen, spent an inordinate amount of time reading versions of each section and then making suggestions for their improvement. The pages that follow, I am sorry to say, can never properly reflect their invaluable input and direction.

In addition, I, of course, owe much to those instructors who provided me with the foundation to perform successful research. Professor Henry Herzog and Professor Hui Chang stand out in this regard. Both devoted a great deal of their time and energy in order to provide the students at The University of Tennessee with quality instruction. They both prepared their students to undertake and complete good applied research. I was fortunate to be one of those students.

I am also grateful to Professors Clifford Donn and Professor Thomas Boehm. Professor Donn was instrumental in the development of the hypotheses of the dissertation while Professor Boehm saved me many hours of tedious work by demonstrating the use of various statistical programs.

A special thanks is due Brenda Henderson who did a remarkable job in typing this dissertation and meeting impossible deadlines.

Thanks to Patricia Berger for her suggestions and support which were essential for the completion of this dissertation.

ABSTRACT

This study examines the labor force hierarchy and investigates how this structure affects geographic mobility. In particular, this research incorporates a version of the segmented labor market model into the migration decision making model of the worker.

A systematic method of categorizing workers into meaningful segments is provided, and contrary to all previous methods, this proposed technique does not rely upon the judgment of the researcher. By categorizing workers into segments or tiers according to the earnings improvement and to the degree of job autonomy experienced by the worker, it is demonstrated that one is able to group workers into meaningful tiers that exhibit characteristics that are consistent with the postulates of the segmented labor market model.

And with the use of discriminant and univariant analysis, this study is able to compare this proposed classification scheme with alternative methods suggested in the literature. This analysis demonstrates that the classification scheme proposed by this study generates segments that are more consistent with the hypotheses of the dual labor market theorists.

Additionally as hypothesized, empirical results show that those workers who are classified as primary workers (those who work within an internal labor market) exhibit geographic mobility patterns significantly different from secondary workers (those who do not work within an internal labor market).

Specifically it is demonstrated that ceteris paribus, those workers who are employed in an internal labor market are more reluctant to undertake a geographic move. Additionally as hypothesized, it is established that primary workers are less responsive to labor market tightness in the local labor market and are more inhibited by length of job tenure when considering a geographic move.

TABLE OF CONTENTS

CHAPTER		PAGE
I.	INTRODUCTION	1
	The Dual Labor Market Model (DLM)	5
	The Evolution of a Dual Labor Market	7
	Geographic Mobility and the Dual Labor Market	12
	Purpose of the Study	14
II.	PREVIOUS STUDIES	16
	Segmentation of the Workforce--the Occupational Mobility of Workers	16
	The Geographic Mobility of Labor	26
III.	HYPOTHESES TO BE TESTED AND METHODOLOGICAL FRAMEWORK	47
	Hypotheses to be Tested	47
	Methodological Framework	52
IV.	DATA, EMPIRICAL MODELS AND ESTIMATION TECHNIQUE	63
	The Data	63
	The Models	67
	Estimation Technique	73
V.	EMPIRICAL RESULTS	75
	Validity of the Categorization Schema	75
	Empirical Results from Estimated Regression Equations	91

CHAPTER	PAGE
VI. POLICY IMPLICATIONS AND CONCLUSIONS	118
Policy Implications	118
Conclusions	120
BIBLIOGRAPHY	122
APPENDIX	135
VITA	138

LIST OF TABLES

TABLE		PAGE
1.	Wages as a Function of Education and Labor	
	Market Experience	59
2.	Differences in Personal Characteristics by	
	Migration Status, 1977-1978	66
3.	Mean Income From Wages, 1978	78
4.	Mean Hours of Unemployment, 1978	79
5.	Periods of Unemployment, 1978	81
6.	Mean Number of Months to Learn Job	82
7.	Percentage Who Received a Promotion,	
	1977-1978	83
8.	Mean Number of Months Without a Job Promotion,	
	1977	84
9.	For Those Who Changed Jobs, 1977-1978, Percentage	
	Who Went to a Job That Was the Same Quality or	
	Worse	85
10.	Percentage of Workers Correctly Categorized by	
	Sector	86
11.	Percentage of Workers Correctly Categorized by	
	Tier	87
12.	Model V-1--The Wage Equation	88
13.	Model H-0--Probability of Migration With no Control	
	Variables for Tier	92
14.	Model H-0--The Probability of Migration--Individual	
	Regression Equations by Tier	94

TABLE

PAGE

15.	Model H-0--The Effect of Other Income on the Probability of Migration	102
16.	Model H-1a--Probability of Migration Controlling for Tier	105
17.	Model H-1b--Probability of Migration Controlling for Tier and Professional/Nonprofessional . . .	108
18.	Model H-2--Differential Response to Employment Pressure in the Migration Decision by Tier . .	112
19.	Model H-3--Differential Response to Months of Tenure in the Migration Decision by Tier . . .	115
A-1.	Breakdown of Industries into Core and Periphery	136
A-2.	Division of Sample into Tiers as Suggested by Osterman	137

CHAPTER I

INTRODUCTION

In an effort to explain wages, neoclassical economics has formulated a model within which wages are the outcome of the interaction between demand factors based upon profit maximizing behavior of employers and supply factors based upon utility maximization of workers. Thus poverty or low wages, according to this view, resulted from two sources: (1) the failure of the wage level to rise above or equal the individual's disutility of work (workers resisting reductions in nominal wages) or, (2) the failure of the individual to undertake investments in his/her future productivity. Thus, according to this framework or paradigm marked by methodological individualism, all sociological phenomena, including poverty, find their roots in either the failure or the free choice of the individual.

While most of the so-called "neoclassicists" do recognize institutional constraints, they, in general, see a labor market governed by maximizing behavior where the traditional tools of price theory are appropriate descriptive mechanisms for analysis.

Of course this is not to say that traditional economics has not recognized the existence of noncompeting groups. From the publication of the Wealth of Nations in 1776 to the most recent writings of Gary Becker, even the more orthodox economists have conceded that, for some, social position seems to be endemic to

factors outside the control of the individual and that competition between individuals as usually envisioned may play only a nominal role.

Adam Smith recognized that the existence of shared needs may lead to repression of competition between individuals. And J. S. Mill saw clearly an incompatibility of the competitive model and observed market behavior. He recognized the existence of segmentation within the labor market and contended that for many there was little chance of social elevation through employment. Mill concluded that:

. . . so strongly marked is the line of demarcation between the different grades of labourers, as to be almost equivalent to an hereditary distinction of caste; each employment being chiefly recruited from the children of those already employed in it, or in employment of the same rank within social custom (Mill, 1848, p. 469).

Moreover, Mill attacks Smith's or the orthodox explanation of wage differentials. Mill (1848, p. 372) contended that:

The really exhausting and the really repulsive labors, instead of being better paid than others, are almost invariably paid the worst of all, because performed by those who have no choice the inequalities of wages are generally in an opposite direction to the equitable principle of compensation erroneously represented by Adam Smith as the general law of the remuneration of labor. The hardships and earnings, instead of being directly proportional, as in any just arrangements of society they would be, are generally in inverse ratio to another.

But the neoclassicist has, in general, dismissed this as an aberrant phenomenon insufficiently pervasive to mitigate the assumptions of the neoclassical paradigm. Moreover, they concluded that much of the apparent anomalies observed or measured in the

labor market were a result of the failure to incorporate certain variables such as education and experience. And with the publication of Theodore Schultz's "Investment in Human Capital" in 1961, human capital theory emerged as the predominant research program of the neoclassicist.

By assuming that jobs are parceled out to workers who are aligned in a queue based upon productivity, human capital theorists postulate that unemployment and wages are a function of an individual's investment in himself/herself through the purchase or acquisition of education, on-the-job training, health, etc. Thus, poverty or low wages and unemployment emanated from a dearth of human capital. This conception of the labor market and society served as the underpinnings of the employment and training programs of the "Great Society" of the 1960's. By increasing the level of training and education of the worker, the federal government sought to elevate the economic and social position for those at the bottom of the labor market.

However, according to the non-neoclassicist, history has demonstrated that higher levels of human capital have not significantly reduced poverty among the designated poor. These economists have presented many quantitative studies which have rebutted the neoclassical view of the labor market (Lucas, 1972; Harrison, 1972; Jencks, 1972). The non-neoclassicist concluded that with better access to education and training provided by the

federal government, labor market differences among groups changed little during the Johnson Administration's 'War on Poverty' (Thurow, 1975).¹

Thus, a number of so-called "nontraditional" labor economists have come to question the viability of the human capital or orthodox model in explaining labor market behavior. These labor economists have presented several phenomena that they contend the neoclassical paradigm has proved incapable of explaining. These include the following postulated anomalies:

1. The distribution of income is more unequal than are the distributions of most measures of ability (Thurow, 1975).²
2. Racial discrimination is a criterion in the selection of employees (Reich, 1971).
3. Employers use educational and training criteria as a "screen," when the level of either has little to do with production on the job (Gintis, 1971; Thurow, 1972).
4. Education and training programs have failed to alter the incidence of poverty (Harrison, 1972).

¹Of course many have disputed this claim and have produced evidence that supported the human capital view of the labor market (see Mincer, 1974).

²A human capital theorist would argue that since ability and education are positively correlated, the income distribution should be skewed.

5. Poverty has persisted in spite of political commitment to full employment and despite a plethora of anti-poverty programs.³

For some, this apparent gulf between reality and theory undermined the validity of the human capital research program.

Normal science does and must continually strive to bring theory and fact into closer agreement, and that activity can easily be seen as testing or as a search for confirmation or falsification (Kuhn, 1970, p. 80).

And with the reputed failure of the human capital model, competitors offered what they perceived as 'viable' alternatives that departed significantly from their discredited predecessor.

As stated by Kuhn (1970, p. 84):

The transition from a paradigm in crisis to a new one from which a new tradition of normal science can emerge is far from a cumulative process, one achieved by an articulation or extension of the old paradigm. Rather it is a reconstruction of the field from new fundamentals, a reconstruction that changes some of the field's most elementary theoretical generalizations as well as many of its paradigm methods and applications. During the transition period there will be a large but never complete overlap between the problems that can be solved by the old and by the new paradigm.

Predominant among alternative explanations of labor market behavior has been the dual labor market model (DLM).

The Dual Labor Market Model (DLM)

In order to interject more realism into the theory of the labor market and to circumvent the proposed weaknesses of the

³The human capital theorist would point to the fact that though poverty persists, its presence has been reduced.

neoclassical assumptions, other economists have more recently developed a model of income determination marked by segmentation. This segmented or stratified labor market model provided a non-individualistic alternative analysis of earnings and posited structural rather than personal factors in its explanation of economic differences among market groups. By concentrating on structural factors in the labor market and breaking the nexus between individual failure and personal attributes, the segmented labor market theorists have forged a model that integrates into the system the societal institutions that were ignored or minimized by the traditional labor economist.

Under the assumption that the labor market is divided or stratified into submarkets among which mobility is restricted, the segmented labor market theorists have attempted to vitiate the neoclassical prescriptions for the maladies of the labor market.

In contrast to the neoclassical or human capital view of the labor market, the stratified or dual labor market theory is inductive. The dual labor market model evolved as a by-product of examining empirical data. On the basis of labor market studies, researchers inferred the operation of a labor market that deviated markedly from the one postulated by the more traditional theorists.

However, the dualists do not offer a single unified alternative to neoclassical theory. They are far from unanimous in their theoretical foundations and their policy prescriptions.

They do focus more on the demand side of the market and attempt to integrate into their analyses those factors ignored by the neoclassicist or human capital theorist. And they tend to distinguish between those markets where the conventional analysis or framework applies and those markets where it does not; hence the name "dualists."

The Evolution of a Dual Labor Market

There are broadly speaking two schools that seek to explain how segmentation develops. There are those who see segmentation emanating from class conflicts and there are those who argue that stratification results from technological factors.

The former see segmentation as a result of a deliberate attempt on the part of the employers to weaken the bargaining power of the employees (Gordon, 1972; Reich, 1971). By subdividing the work force and pitting one group against another, the employer diminishes the bargaining power of the worker. For example, in early twentieth century America employers, through selective hiring, manipulated ethnic antagonisms to divide or segment the work force (Reich, et al., 1973, p. 362). According to this radical perspective, labor market segmentation supports the objectives of the capitalistic system. It abets the exploitation of the worker by the monopoly capitalist.

Other radicals contend that cultural factors account for the segmentation. These include housing, segregation, ghettoization

and employer discrimination. These radicals draw upon sociological explanations of the labor market and explain stratification in terms of historically rooted class based motivations. Tastes and social position become wholly endogenous variables. They argue that this system, marked by stratification, serves the interest of the few (the employers) at the expense of many (the employees). As stated by Reich, et al. (1973, p. 364):

Labor market segmentation arose and is perpetuated because it is functional--that is, it facilitates the operations of capitalist institutions. Segmentation is functional primarily because it helps reproduce capitalist hegemony.

The less radical dualists propose that segmentation is a consequence of market forces. Berger and Piore (1980, p. 7) suggested that the dual labor market is precipitated by the employer's reaction to uncertainty. In those industries and markets where demand fluctuated dramatically, employers sought a work force that was likewise variable. Thus, a dual product market generated a dual labor market (stable vs. unstable).

Others contend that, duality arises from, ". . . a dichotomy between large firms possessing considerable market power and smaller firms possessing much less market power" (Alexander, 1976, p. 15). And with wages positively and highly correlated with this market power, these researchers saw the labor market divided into a high wage and a low wage sector. Non-competitive product markets provide monopoly rents which can be distributed to workers to insure the existence of a queue of potential workers. And with the appearance of capital intensive, oligopolistic

firms, corporations required stable product markets along with a stable labor supply to insure that their plant would not go underutilized. Thus, according to this perspective, the labor market was divided according to the degree of competitiveness in the product market.

Still others, chiefly Doeringer and Piore, argue that duality is the result of the types of jobs offered by firms in the labor market. These jobs differ essentially by the fact that those in the primary sector, or upper strata of the labor force, exist in internal labor markets while those in the secondary sector, or lower strata of the labor force, do not.

"Internal labor markets appear to be generated by a series of factors not envisioned in conventional economic theory: (1) Skill specificity, (2) On-the-job training, and (3) Customary law"⁴ (Doeringer and Piore, 1971, p. 13). According to Doeringer and Piore these internal markets are of value to both the workers and to the management.

The worker derives benefits due to two fundamental factors. First, the internal labor market offers both stability and greater chances for advancement. Second, the internal labor market provides workers with a feeling of fairness. That is, this mechanism provides equity and due process. "The rules which govern an internal market are thought to effectuate standards of

⁴Doeringer and Piore mean by customary law "past practice." Dependence upon "past practice" means that any procedure, if repeated becomes "customary" (1971, p. 25).

equity that a competitive market cannot or does not respect"
(Doeringer and Piore, 1971, p. 29).

The employer receives several benefits from the operation of an internal labor market. With a more stable work force, the employer can now provide training with less fear that the worker will leave his firm. Additionally, since most jobs are filled from within, the employer minimizes his/her screening and hiring costs. The employer will attempt to minimize interfirm mobility by paying the worker slightly more than the worker could earn elsewhere. Thus, the internal labor market evolves due to the employer's policies regarding recruitment, promotion and training practices and the employee's desire for stability (Doeringer and Piore, 1971, Chapter 2). It is sort of a "make or buy" decision for the firm. In the internal labor market, the employer chooses to "make."

In the secondary market, internal labor markets are either open or nonexistent. In the "make or buy" decision, the firm chooses to "buy." Since employers provide little training for workers in the secondary sector, workers lose little by changing employers. In the secondary sector, turnover occurs because there is little or no provision of firm-specific training. Employers provide no such training since they assume workers to be prone to instability. Thus, the behavior of each reinforces the behavior of the other.

This action or reaction, of course, freezes workers out of jobs in the primary sector and entrenches the primary worker into

employment in the internal labor market. With the hope and expectation that workers will remain with the firm for some time, employers will rely heavily on recruiting those workers who are trainable--those workers who demonstrate a more stable work history. The worker who possesses a less stable work history, on the other hand, must seek employment in what has come to be known as the secondary or periphery labor market.

Feedback mechanisms in the secondary market encourage workers who hold "bad" jobs to become "bad" workers. Arrow, investigating a variant of this feedback mechanism, demonstrates that workers who believe that they will receive lower returns from their training will undertake less training (Arrow, 1973).

Other institutional factors reinforce this dichotomy within the work force. Trade unions, for example, certainly rigidify the internal labor market within many firms and lock many out of primary sector employment. These unions tend to institutionalize protective customs of the firm and strengthen existing regulations (Loveridge and Mok, 1980, p. 387).

Lawrence Kahn found that the Longshoremen's union in San Francisco improved working conditions and stabilized employment. Kahn (1976, p. 337) contended that his ". . . results suggest that unionization of secondary workers can transform secondary into primary jobs"

But most evidence supporting segmentation, has been drawn from cross-sectional data and has consequently ignored the dynamics of the labor market. This study, by employing longitudinal

data, will attempt to support the existence of segmentation within the labor market and provide greater credibility to the claims of the dualists by examining worker employment experience over time.

Geographic Mobility and the Dual Labor Market

Most labor markets are similarly indefinite in their specification of the sellers and buyers. Such a labor market is merely an area, with indistinct geographical and occupational limits within which certain customers seek to offer their services and certain employers purchase them (Kerr, 1954, p. 93).

As asserted by Kerr, geography, job requirements and skill attributes of the worker govern the extent of the labor market. But with the evolution of institutional rules within the labor market, labor markets are more clearly defined and entrance and exit are more rigidly determined.

These rules play a much more important role in the primary market and are either nonexistent or ill-defined in the secondary market. As stated by Kerr (1954, p. 101), "Institutional rules, however set sharper boundaries between the internal and external markets and define more precisely the points of entrance."

These rules, of course, impinge upon the geographic mobility of workers. "Fraternity triumphs over liberty as no trespassing signs are posted in more and more job markets" (Kerr, 1954, p. 96). But it is very likely that these institutional rules affect the geographic mobility of workers in very different ways. That is, geography defines the labor market more for some than others (Kerr, 1954).

These institutional rules foster the formation of cohesive groups. Members of these groups become reluctant to demonstrate divergent behavior and they tend to promote group norms which encourage stability (Piore, 1975, p. 131). This, of course, influences the geographic mobility of these groups.

But little work has been done investigating how this socialization affects geographic mobility. Piore (1975), however, contended that the stratification is affected by migration. He contended that the process of geographic mobility, rather than promoting employment opportunities, actually contributed to the lack of stable, good jobs for the worker.

. . . that the process of migration and the presence of large numbers of recent migrants in the community are disruptive of the transition (from adolescence to adulthood) because they inhibit family formation, peer group development, and maintenance of stable employment; and thus, that the migrant process is a major determinant of the relative numbers of the lower and working classes (Piore, 1975, p. 146).

This view of migration is in sharp contrast to most empirical research that, in general, supports the contention that individuals undertake a geographic move in order to improve their economic standing. Additionally, there has been a plethora of research that supports the existence of a higher propensity to move among the more economically advantaged. Others have demonstrated that, the more economically affluent communities possess more mobile populations in terms of both past and future mobility (Rose, 1958).

Many studies have examined hierarchical structures in the work force and its effect on geographic mobility. Mobility has

been examined by occupation (Tarver, 1964), by skill level (Bancroft and Garfinkle, 1963), by income group (Lansing and Mueller, 1967), and by white collar versus blue collar (Willis, 1972). However, no study has attempted to examine how the stratified labor market affects geographic mobility. This study will undertake this task. By utilizing longitudinal data, this study will investigate a more dynamic concept of work force hierarchy and observe its effect on geographic mobility.

Purpose of the Study

This study will examine the geographic mobility of workers in the context of the dual labor market. It will seek to determine how the institutional rules and customs of the internal labor market affect geographic mobility. It is hypothesized that geographic mobility among members of the respective segments will differ markedly.

Of course, initially a consistent, reliable method must be employed to categorize the workers into meaningful segments. This study will present and utilize such a method. A more concrete categorization schema will be provided which will make the dual labor market model more deterministic.

The primary concern of most dualists has been empirical. Their methodology has been depicted as sketchy, vague and diverse if not internally conflicting (Cain, 1976). Further, "No rule is provided to designate which jobs go into one or the other sector" (Cain, 1976, p. 41). This study will provide such a rule and

demonstrate that this rule provides a categorization scheme that is consistent with the tenets of the basic segmented labor market model.

All previous studies have employed judgment in assigning workers to segments.

I suggest, however, that until the SLM theories are formulated more explicitly and precisely, the empirical rather than methodological challenges provide more useful topics for debate (Cain, 1976, p. 1230).

This study advances a classification method whereby the dual labor market model is provided a more deterministic buttress. Additionally, after categorization into sectors, this study will examine the differential migration patterns among the workers of the respective sectors.

Chapter II will present a review of the relevant literature, and where appropriate, indicate how the current research will build upon these studies or, in some cases, how this research will address issues not considered by the past studies. Chapter III will identify the propositions that will be tested and the methodological framework of the analysis to be found in subsequent chapters. Chapter IV will identify the data to be employed and the mathematical models and estimation techniques to be utilized. Chapter V will present the empirical results and Chapter VI will provide probable policy implications and concluding remarks.

CHAPTER II

PREVIOUS STUDIES

Past studies exploring worker mobility have either examined labor market segmentation with scant attention paid to the geographic dimension of segmentation or have looked almost exclusively at the geographic element ignoring the segmentation issue. Thus, research has been clearly demarcated into two distinct subdisciplines--labor economics and regional economics. This chapter will review past literature similarly. The first section will discuss those studies that address occupational mobility while section two will review past research that examines geographic mobility.

Segmentation of the Workforce--the Occupational Mobility of Workers

Controversy and disagreement have marked the field of labor economics over the past two decades. During the 1960's, the human capital approach provided the framework for the massive education and training programs that ushered in the "Great Society." During and subsequent to the disputed failure of these programs, many non-traditional labor economists developed models that provided alternatives to the human capital model. These models sought to account for the argued ineffectiveness of human capital programs. These non-traditional economists attempted to provide models that they perceived more clearly portrayed the United States' labor market.

However, the human capitalists did not surrender nor were their theories at a loss to explain past manpower program failures. The fight persists. Each side has provided studies that vitiated the assumptions and claims of the other.

The segmented labor market theorists have provided the most serious challenge to the human capitalist's labor market model. Though the contenders have presented no unified, ubiquitous alternative to the human capital theory, they have offered other plausible explanations of labor market behavior.

In an attempt to bolster their claims, the dual labor market theorists have relied almost strictly on observed behavior of workers in the labor market. Basic to their formulation of an adequate competing program or theory have been empirical tests of the alternative models. Fundamentally these labor market researchers have attempted to determine the extent of segmentation within the United States labor market. These studies proceed from the categorization of workers into segments to a test of the degree of mobility among the segments.

Of course fundamental to all of the studies addressing stratification within the labor market has been the categorization of workers into meaningful segments. Studies have relied upon income, (Andrisani, 1973; Schiller, 1977; Lowell 1978), occupation (Osterman, 1975; Mayhew and Rosewell, 1979), industry (Morley, et al., 1979; D'Amigo, 1978; Oster, 1979) and a combination of industry and occupation (Rumsberger and Carnoy, 1980).

Of the studies testing the dual labor market model, researchers often cite the work performed by Paul Andrisani. In this study, Andrisani, ignoring education level, differentiated secondary and primary jobs according to average earnings by three-digit occupational category: those occupations with an average income above the overall median fell in one segment and those below fell in the other segment. He concluded that the likelihood of movement from the secondary to the primary market was greater than secondary market confinement. Though Andrisani did conclude that race and social environment were important and destine some workers to the secondary market, he argued that these factors were insufficient to vitiate the neoclassical thesis. However, Andrisani's study suffered from two factors:

- 1) The assignment of jobs to the secondary or primary sector based upon average earnings by occupation ignores the diversity among workers within an occupation as to earnings, job stability and working conditions.
- 2) The hypothesis of barriers to occupational mobility and feedback phenomena deal with behavior over time. Thus, it is inappropriate to use cross-sectional data to test for upward mobility, as Andrisani has.

Bradley Schiller (1977), also using income as a method of categorization, constructed a dynamic model to test for the extent of mobility or stratification in the labor market. Employing longitudinal earnings data, he demonstrated that there is extensive mobility of United States' workers. By utilizing relative earnings

mobility as an indirect test of alternative earnings functions, Schiller negated the existence of a dual earnings function. As stated by Schiller (1977, p. 927):

Of the models tested, the on-the-job training (OJT) variant of human capital models stands out in this regard, while serious doubts emerge about those models that postulate varying degrees of segmentation or immobility.

Schiller assigned workers to cohort groupings by average yearly earnings. He then measured the probability of changing membership in a cohort group by observing changes in the mean level of earnings for a subsequent year. However, Schiller did not take into account hours worked. In other words, some of those who exhibited upward mobility may have been simply changing employment status from part-time to full-time. Additionally he did not segregate college students, military and others whose work force experience and patterns of earnings are apt to differ markedly from other members of the work force.

Many other theorists have utilized occupation as a scheme for categorizing workers into distinct segments. Thus, if a worker moves from an occupation in the secondary sector to one in the primary sector, one would accept this movement as supporting evidence for the existence of upward mobility in the work force.

Categorizing workers by occupation, Paul Osterman (1975) found a wage-setting process that differed substantially among segments. His research supported the existence of a segmented labor market. By establishing the independence of earnings, experience and formal education for workers in the secondary

sector, Osterman refuted one of the major contentions of the human capital theorists--that by investing in themselves, workers will improve their earnings. Osterman, using cross-sectional data, uncovered a flat earnings/age profile in the secondary sector. This is, of course, inimical to the human capital theory of the job market if one assumes that workers become more proficient in their work with greater job experience.

Osterman argued that segmenting the labor market into two parts leaves a primary sector of enormous variety. Thus, Osterman divided the primary sector into an upper and a lower tier. Osterman's upper tier consisted of those, normally professionals, who earn higher pay, possess greater promotional opportunities and experience greater job autonomy. These workers, according to Osterman, demonstrate turnover patterns very similar to secondary workers. Osterman's lower tier is generally considered to be well-paid blue-collar workers who possess little job autonomy and experience little participation in the work process but possess job specific skills.

He found that the earnings of the workers in the secondary sector were primarily dependent upon time worked and were substantially independent of experience and formal education. That is, one would expect to observe a relatively flat earnings/age profile in the secondary sector.

However, Osterman's research has been subsequently denounced by both human capital theorists and dualists. William Kruse (1977) argued that Osterman's techniques served to bias downward

the estimated effect of human capital variables on earnings. Kruse insisted that the method of categorizing workers into primary and secondary segments, based upon low wages and job instability, truncates the dependent variable, earnings. This, according to Kruse, leads to a downward bias in the coefficients of the independent variables age and education when earnings are regressed against these two variables. Thus, one would expect to see low values for the coefficients of the independent variables--age and education. Kruse stated that Osterman erred in other important aspects. Since Osterman examined only those who remain within the secondary sector, he ignored one of the main reasons for human capital investments--to move to the primary sector. Hence, according to Kruse, the results generated from Osterman's secondary group say little about the efficiency of human investment programs among secondary workers. Moreover, argued Kruse, the omission of a variable representing experience biased the estimated coefficient of schooling downward since schooling and experience are negatively correlated and both are positively correlated to earnings.

In a further assault on the Osterman study, Langley (1979), reproducing Osterman's work, found that the coefficients of both age and education were significant in a regression equation explaining earnings in the secondary segment. In fact, Langley concluded that a year of education returns more in the secondary sector than in the primary sector.

However, in a rejoinder, Osterman argued that Langley made several errors en route to his conclusions. First, stated Osterman, Langley erred by including students--a group whose traits and supply side characteristics differ dramatically from other members of the secondary sector where they are likely to be concentrated. Second, Langley constructed a full-time dummy variable for those persons with more than 42 weeks of employment averaging thirty or more hours per week. However, census categories of weeks worked per year include 27-39, 40-47, 48-49 and 40-52. Thus, utilizing weeks as the cutoff biases the results, contended Osterman.

Casting further doubt on Osterman's methodology and conclusions, Mayhew and Rosewell (1979, p. 86) stated that ". . . Osterman's analysis is illegitimate unless he tests whether there is mobility between the segments." They concluded that there is insufficient evidence to warrant an occupational segmentation or stratification of the labor market. By comparing three digit occupational codes at several points in time, they found mobility at every point on the occupational distribution.

However, several factors diminish the significance of their findings. First, the use of occupation as a method of categorization ignores the fact that many occupations exist in both what is normally thought of as the secondary sector and what is usually perceived to be the primary sector. Second, since college students and other non-traditional workers (part-time, military, etc.) are included in their analysis, the possibility of upward mobility is likely exaggerated.

Other researchers have used industry as a categorization technique. Dividing the labor market into core (primary) and periphery (secondary) sectors Beck, et al. (1978, p. 704) ". . . find substantively and statistically significant differences in labor force composition and economic status between core and periphery industrial sectors." By allocating to the core sector those industries with high unionization, high levels of capitalization, large profit margins and market concentration, Beck, et al. concluded that earnings differences between individuals were statistically explained more fully by structural factors rather than the individual factors relied upon by human capital theorists. And Beck, et al. found that employment in a core or periphery industry was the most important of the structural factors in explaining earnings differentials.

Bibb and Form (1977) also found structural factors (occupation, industry, unionization, etc.) to be more important than individual factors (age, education, experience, etc.) in explaining income. The structural hypothesis proposes that workers are denied access by societal action on the part of employers, unions and other social or political groups. Assigning industries to core or periphery using the same criteria as Beck, et al., Bibb and Form (1977) computed an average annual earnings disadvantage of \$3,057.97 for workers in the periphery sector. Further, they found a worker would gain \$1,037.49 annually by being located in the core sector rather than the periphery. The latter figure

holds occupation, education and other individual characteristics constant while the former does not.

Still others have used race or other individual measures of work force disadvantage to assign workers to segments or to test a segmented version of the labor market. By making the assumption that black workers were disproportionately confined to the secondary sector, Duane Leigh segmented the work force into primary and secondary workers by race. He found that the impact on earnings of interfirm and interindustry occupational mobility did not appear to be systematically larger for whites than blacks. This finding, he argued, cast doubt on a more literal interpretation of the dual labor market model (Leigh, 1976).

Rocha (1966), employing a similar method of categorization, discovered evidence contradictory to Leigh. Analyzing the Baltimore, Maryland labor market, Rocha divided his sample into two groups of workers--one white, the other black. In his sample, blacks exhibited a large amount of shifting about in the labor market. However for blacks, these moves had little effect as far as occupational upgrading was concerned. At the end of five and one half years, three-fourths of the blacks who accepted their initial jobs as unskilled remained unskilled. In contrast, a majority of the white workers were classified as skilled at the beginning and end of the sample period.

But Freiman (1976), examining the mobility of disadvantaged workers, did not unmask restricted mobility for these workers. His analysis centered on non-white youths with less than twelve

years of education. His regressions did not reveal restricted upward mobility for these disadvantaged youths who were placed initially in low quality jobs. Accordingly, Freiman asserted that a fairly rigorous definition of the dual labor market model was not a particularly useful characterization of reality.

But is segmentation of the labor force a racial or sexual phenomenon? Though the theory of the proponents of labor market segmentation does not constitute a single, unified alternative to neoclassical theory, most would assert that race and sex are only two among many factors that account for segmentation. The tests employing race or sex as a method of categorization are in fact not testing a dual labor market but are in fact testing different experience in the labor market by race or by sex. They become nothing more than models testing discrimination in the work force.

In another study Leigh (1975) examined the mobility patterns of a large sample of young men. He found that among this group there was a considerable amount of occupational upgrading. He found a positive correlation between education or vocational training and upward mobility. He further argued that structural factors such as region and industry were insufficient causal forces to prevent upward mobility on the part of the worker who chose to undertake human capital investment.

Though members of the opposing sects have produced a wealth of studies to validate their claims, each side remains steadfast in its convictions. The segmented labor market theorists as "the new

kid on the block" fight the uphill battle. As a primarily empirically based theory, the DLM theorists have pointed to the failures of the human capitalists to explain: 1) the persistence of poverty, 2) the failure of public education and training programs to alter the distribution of income and, 3) the persistence of racial inequality and discrimination. With the advent of better data sets which provide accurate longitudinal information on the work history of individuals, the dual labor market theorists of the 1980's can more easily demonstrate the adequacy of their research program. This study will take a step in that direction.

The next section will review the more important research on geographic mobility as it relates to the work force and as it applies to factors examined in this study.

The Geographic Mobility of Labor

Economists have generally tackled the analysis of labor migration as a special case of income maximization.

The results indicate that the pattern of geographic mobility of workers may be explained as if individuals considered the benefits and costs of moving in the context of a general investment problem. Higher net out-migration rates are found for those population subgroups which stand to gain the most from moving, as well as for blacks and for the very poor (Bowles, 1970, p. 361).

But most migration researchers concede that the income maximization models work well for some groups but fail miserably for other groups. For example, it has been demonstrated that repeat movers appear to react differently to economic stimuli than primary movers (DaVanzo, 1976). And both of these groups exhibit migration

patterns different from those of return migrants. Additionally, other researchers have empirically validated differential migration patterns among the races (Persky and Kain, 1970). Still others have looked at migration and employment status and found the unemployed to be more apt to move, ceteris paribus (Saben, 1963).

Studies, in general, have depicted migration as a function of the characteristics of the individual, characteristics of the region and difficulty of the journey. Of course, paramount among the personal characteristics of the individual is his/her position in the labor market. This study will demonstrate that this position is more adequately reflected by the worker's sector or tier. The subsections that follow will discuss the factors that affect the decision to migrate.

Work Force Hierarchy. According to Katz (1958), workers, largely professionals (a subset of primary sector), tend to keep in touch with colleagues with whom they worked at one time. Thus, these workers establish themselves in nationwide "networks of contacts." Of course, individuals use these contacts extensively when searching for a job. These occupational networks provide researchers with leads as to the magnitude and incidence of migration.

Not surprisingly, Pihlblad and Gregory (1957) established that the professional possessed the highest propensity to migrate and tended to travel the greatest distance in search of a job. In their study, they found that while nearly one-half of the entire

male population resided in the county of their public school attendance, only one of eight professionals so resided. And in terms of distance migrated, about 40 percent of the professional men had moved beyond the state boundaries while only 25 percent of all males had moved beyond the state boundary.

A. R. Miller (1960), likewise, discovered that white professional workers possessed the highest propensity to migrate of all groups in every age category save one. Tarver's study (1964) also confirmed that professional workers possessed the highest propensity to migrate among ten occupational groups. Additionally, he established that professionals and semi-professionals tended to move the greatest distance. Disaggregating to the county level, Tarver concluded that farmers, farm managers, craftsmen, foremen, kindred workers and operatives are the least mobile. Of the twelve occupations in Tarver's high propensity group, none were in manufacturing whereas ten were categorized as professional. And of the twelve occupations in the low propensity group, five were in manufacturing.⁵ Of course, since labor market boundaries are seldom coincident with county boundaries, Tarver's ability to distinguish between intra-market moves and inter-market moves was severely limited. This study will eliminate this problem by aggregating to labor market areas.

⁵ This finding is consistent with hypothesis number one of this study. Essentially this hypothesis states that mobility will be lowest among those workers who are employed in an internal labor market. It is quite likely that these internal labor markets are more pervasive in manufacturing.

Confirming the higher propensity to migrate among the professionals, the Current Population Survey One-Year Mobility Studies showed migration rates highest at the top and at the bottom of the occupational ladder. But when longer time periods were used, the measured propensity to migrate of those at the bottom of the occupational scale dropped because a great deal of their mobility was circular. Five year rates were more sensitive to permanent, one-way mobility that characterized professional labor.

Of course, the migration rates among individual occupational groups (two digit SIC code) vary considerably from that of broad occupational classes (one digit SIC code). For example, among the professionals, those occupations that require heavy investments in capital equipment or the building of clientele generally exhibit low migration rates (Ladinsky, 1967). These occupations include: lawyers, physicians, dentists, pharmacists, photographers, architects and funeral directors. On the other hand, those who work in organizations that are geographically scattered are characterized by high migration rates (e.g. teachers), when disaggregated to the county level.

This study will investigate the importance of work force class structure on the decision to migrate. This study will seek to demonstrate that broader measures of segmentation more clearly match a priori expectations.

Education. Greater levels of education will, ceteris paribus, increase the propensity to move geographically. "Employment information and job opportunities are both expected to increase with

increased education" (Greenwood, 1969, p. 406). And Bowles (1970), who examined migration in the context of investment decision-making, proposed that education increases the responsiveness of individuals to economic differences between regions. Thus, equipped with more opportunities and more information about far-away areas, the better educated individual is more apt to abandon his/her current residence in pursuit of these opportunities.

Additionally, Schwartz (1973) found that the deterring effects of distance declined substantially with education. He attributed the negative impact of distance on migration as emanating from diminishing information. And in a subsequent study, Schwartz (1976) proposed that a firm's area of search for workers to perform a certain job increases with the level of education required by the job. Additionally, he concluded that the higher the level of education of the individual, the larger the area searched for a potential job. And Folger and Nam (1967) concluded that the poorly educated were almost as likely to be involved in a short-distance move as the well-educated. Supporting this distance/education correlation, Saval and Hamilton (1965) showed that there was a positive correlation between migration and education which became stronger as the distance between origin and potential destination increased.

But the coefficient of the education variable has been computed as negative for certain subgroups. Schlottmann and Herzog (1981), in a disaggregate model, computed a negative coefficient

for the variable, years of education, when they examined the decision to migrate of the unemployed worker who had not moved previously.

Living within their states of birth and having little or no mobility experience, this latter cohort is probably much more tied to the origin state through such factors as friends and relatives than are the unemployed with prior mobility (Schlottmann and Herzog, 1981, p. 596).

In their estimated regressions on the pooled data, they estimated a negative, statistically significant value for the coefficient of the education/unemployment interaction term for the worker with no prior moves. This indicated that the better educated, unemployed worker, who had not moved previously, was less likely to undertake a geographic move than his/her less educated counterpart.

Since employment status and prior mobility are controlled for in this study, it is expected that a positive correlation between the level of education and the probability of migration should be observed.

Age. Numerous studies have substantiated the negative relationship between age and the propensity to migrate (Gallaway, 1969; Schwartz, 1973; Kau and Sirmans, 1977; Lowry, 1966). It is proposed that since older persons have less time in which to realize the economic benefits of migration, their return on migration is lower (Greenwood, 1975). Additionally, Gallaway (1969) proposed that family ties and community relationships were factors that became more inhibiting to the potential migrant as he/she grew older. Gallaway computed that in order to undertake a geographic

move a worker needed \$85 to compensate him/her for each additional year of age, other things equal. As stated by Sjaastad (1962, p. 85), "Since people are often genuinely reluctant to leave familiar surroundings, family, and friends, migration involves a psychic cost."

Not only do older workers have a shorter time horizon in which to enjoy the economic benefits of migration, they also experience greater variability in returns to migration.

Both the greater variability of returns to migration at a late age, and the probable overstatement of expected returns among older workers lead to the same conclusion; we expect that the effect on the migration rate of the expected lifetime income gain from moving is greater for younger workers (Bowles, 1970, p. 358).

And Schwartz (1976) proposed that the area of job search is governed by the earnings function of the individual and thus is a function of the age and education of the worker. He concluded that for any education level, migration declines with age. However, Schwartz concluded that the rate of decline is greater for the better educated. This follows from the assumption that workers' skills specific to an occupation rise over time at a rate which increases with education.

And in a recent study, Schlottmann and Herzog (1982) found that increasing age negatively affected the propensity to migrate for both the repeat and non-repeat mover.

Morgan and Denton (1975) in a study analyzing the migration patterns of East Tennesseans found that heads-of-household's psychic costs of moving increased \$67 for each additional year of the respondent's age.

Since distance between origin and destination affects both information and psychic costs, one should observe a decrease in the age elasticity in the estimated migration equation when the distance variable is entered. Nonetheless, virtually all past studies in migration have computed a negative coefficient for the age variable in the estimated migration equation regardless of other variables included.

Of course, part of this negative effect is due to job specific training received on the job and to benefits that accumulate with greater job tenure. That is, the cost of switching occupation and/or industry increases with age (Schwartz, 1976). Since this study will incorporate an independent variable measuring job tenure, and an independent variable to account for occupational change, the measured negative impact of age should be less in the estimated migration equation. Additionally, since the variables education, home ownership and prior mobility will capture much of the psychic costs involved in a move, this study should more accurately demonstrate the psychic costs due directly to age.

Prior Mobility. The influence of prior mobility on current observed mobility patterns has absorbed much of the attention of migration researchers (DaVanzo, 1976; Kau and Sirmans, 1976; Vanderkamp, 1968). Navratil and Doyle (1977), in their disaggregate model, found that people who have moved at least once were much more likely to move again. And H. T. Elderidge (1965) estimated that for persons five years and older, the probability of

a primary or first time move was .06 while the probability of a repeat move was .18.

Intuitively this empirical observation makes good sense. Since new or first time migrants are likely to possess less information about potential destination areas, one would expect to observe a lower propensity to move on their part. In her study of labor force migration for the periods 1955-60 and 1960-65, Julie DaVanzo (1976) found that those who had previously moved at least once were much more likely to move (again) than those who had not previously moved. She computed a migration rate of 1.4 percent for first time migrants and a rate of 15.90 percent for repeat movers.

This study, in order to measure the effect of prior mobility, will compare current residence by Bureau of Economic Analysis labor market area (BEA) to the labor market area of birth (BEA).

These areas were constructed in 1969 by the Bureau of Economic Analysis [then known as the Office of Business Economics (OBE)]. This agency demarcated functional economic areas in order to facilitate their analyses and to formulate economic projections. In metropolitan areas, Standard Metropolitan Statistical Areas (SMSA's) were chosen where possible. And in non-urban sections of the country, where there were no metropolitan areas, cities with a population of 25,000 to 50,000 were chosen as appropriate economic centers provided that the city formed a wholesale trade center for the outlying area and provided that the population of the area was at least 200,000. In rural areas, counties were combined according to journey to work information to form economic areas. After the

identification of economic centers, counties were allocated to the approximate center (Olsen, et al., 1977, p. 2-1).

Utilizing this method, each area tends to include the place of work and the place of residence of its labor force and qualifies as a labor market. The Bureau of Economic Analysis, accordingly constructed 173 functional economic areas which include all of the land area of the fifty states of the United States. In the current study, only those areas within the forty-eight contiguous states and the District of Columbia were considered. A map of the 173 BEA areas is illustrated in the Appendix Figure A-1.⁶

Home Ownership. Family and community ties decrease the migration probabilities of inhabitants within a labor market. Certainly, home ownership should serve well as a proxy variable for these bonds. With home ownership, one is likely to feel more allegiance to his or her community. Additionally, the difficulty of selling and buying a home restrains many from undertaking a geographic move.

As stated by Nghiep (1981, p. 65):

The overall empirical results on the relationship between migration and personal characteristics suggest that individuals whose socioeconomic position is not well established yet--unmarried, unemployed, not owning a house--have a higher propensity to migrate.

In each of his estimated migration equations, he computed a negative coefficient for the variable home ownership. And in most

⁶ These BEA economic areas have since been redefined.

cases the coefficient was significant at the 99 percent level of confidence. Lansing and Mueller (1967, p. 15) reported that:

Of heads of families who moved in the last five years, 30 percent owned or were buying their homes. This percentage is about half the proportion of home owners in the population at large. It seems, therefore, that home owners are less likely to move.

This study will employ a binary variable in the estimated migration equation to account for home ownership.

Income. Higher levels of real wages affect migration probabilities in several ways. A higher income can more readily finance the out-of-pocket costs of a geographic move. In addition, higher income can more adequately finance the costs of job search in another geographic area. In contrast to these two factors which increase the probability of a geographic move, higher real wages and the probability of moving geographically may be negatively related for some since as an individual moves up the promotional ladder he/she is likely to attain higher wages and more job specific skills which limit mobility. This also increases the opportunity cost of unemployment. However, since this study includes a variable to reflect job tenure, this negative impact of income on the propensity to migrate should be reduced, thus more adequately reflecting the relationship between income and the propensity to move geographically.

Most aggregate models have estimated a negative and significant relationship between family income and total out-migration within a region (Miller, 1973; Morgan, 1976; Navratil and Doyle,

1977). Bass and Alexander (1972) found a positive but insignificant relationship between 1950-1960 net interstate migration rates and earnings for both blacks and whites. And Cebula and Vedder (1973) documented a slight but positive correlation between 1960-1968 net migration and per capita income for 39 SMSA's. In their disaggregate model of interstate migration between 1965 and 1970, Schlottmann and Herzog (1981) computed a negative coefficient for the income variable for each subgroup except for the unemployed, first-time mover.

Thus, it appears that the degree of aggregation exerts an important influence on the sign and statistical significance of the coefficient of the income variable. Navratil and Doyle (1977) investigated the sensitivity of empirical results to the level of aggregation. They concluded that the effect of personal characteristics on the decision to migrate is highly sensitive to the level of aggregation. Aggregation reduces the amount of variance in any variable.

Also, the choice of a spatial area should affect the elasticity of the income variable in the estimated equation. It is likely that the elasticity of the income variable will decline as the size of the spatial area declines since the financing of the out-of-pocket costs will be smaller and since the cost of job search is likely to be lower. That is, the selection of smaller spatial areas will mean the inclusion of more short distance moves where income tends to exert less influence.

This study, by separating labor or wage income from other types of income, will be able to more clearly identify the labor market factors that inhibit or encourage geographic mobility. Additionally, since income for each member of the household is separately identified in the data set, this study can more clearly investigate the effects of income on geographic mobility.

Employment Pressure. In its simplest form, neoclassical theory proposes that workers, attempting to maximize economic gain, will move away from those areas where economic opportunities seem the least and toward those areas where economic opportunities appear greatest. To quote J. R. Hicks (1932, p. 76), ". . . differences in net economic advantages, . . . are the main causes of migration."

Thus, one would expect to observe a higher probability of migration from those areas with high unemployment rates. However, the evidence has been at best ambiguous and in many cases the observed patterns have been in the opposite direction of expectations. As stated succinctly by Greenwood (1975, p. 411), "One of the most perplexing problems confronting migration scholars is the lack of significance of local unemployment rates in explaining migration."

In several of the studies, investigators have computed higher in-migration rates into areas with higher unemployment rates (Greenwood, 1969; Rogers, 1967; Wadycki, 1974). Others determined the unemployment rate to be statistically insignificant in the

estimated migration equation (Gallaway, 1967; Fabricant, 1970; Miller, 1973). Only a few have found the variable to possess the expected sign and to be statistically significant. In these few studies, the expected relationship held only for certain subgroups (Lowry, 1966; Sommers and Suits, 1973).

Several factors likely account for this lack of correspondence. First, the failure to account for prior mobility could provide part of the justification. As pointed out by Miller (1973), in-migration rates and out-migration rates are positively associated. Miller argued that those areas with high historical in-migration rates possess populations that are much more likely to move again.

Second, due to the small size of the unemployed work force relative to those who are at risk to migration, a change in the unemployment rate is likely to mean very little to the migrant or to the potential migrant. This is especially true since in most cases the migrant has a job before he/she migrates (Greenwood, 1975, p. 411).

Third, for many parts of the United States, unemployment rates are not very reliable measures of labor market tightness. For example, some areas of the country have a higher percentage of discouraged workers who are not counted among the unemployed but who are more likely to migrate. Additionally, the use of beginning-period unemployment rates or end-of-period unemployment rates is likely to be an unreliable measure of labor market tightness

when the dependent variable spans a period of time five or more years in length. Muth (1971) demonstrated that a serious simultaneity problem may exist in migration studies that use end-of-period unemployment rates. With the use of a single equation model along with the end-of-period unemployment rate, Muth contended one introduces serious specification bias.

Fourth, many studies made the assumption that the state was an integrated labor market (Miller, 1973). While SMSA's and BEA areas are sufficiently integrated and homogenous to serve as proxies for local labor markets, states are not (Morgan, 1976). Thus, the use of one overall unemployment rate for each state (e.g. California) certainly diminishes the importance of findings derived from such a study and can account for the lack of a significant relationship between area unemployment and geographic mobility.

This study should circumvent or minimize the effects of the aforementioned since (1) a variable is inserted to account for prior mobility; (2) a variable is inserted to account for employment status; (3) a one year time span is used, thus simultaneity problems are minimized; (4) BEA economic areas are employed to serve as local labor markets.

But if the unemployment rate has been proven of dubious value in a regression equation explaining migration, what variable will more adequately capture the tightness in the local labor market and its effect on migration?

Fields (1976) contended that turnover is a more encompassing measure of labor market opportunities or tightness within a local labor market.

Migrants, however, are presumably more concerned about turnover in the labor market and would be expected to pay much more attention to the rates at which hiring for new jobs is taking place, currently employed workers are losing or leaving their jobs and the like (Fields, 1976, p. 408).

Fields concluded that net labor force migration into twenty SMSA's was significantly affected by work force turnover. The variable turnover possessed the expected sign and was statistically significant in the estimated regression equation. However, since turnover rates are available only for manufacturing and unobtainable for many BEA areas (43 in 1977), most studies have not used this variable.

Migration studies have, in most cases, found the variable, employment growth or some variant of it, to be an important variable in describing both net and gross migration. In fact some studies have shown it to be the most important explanatory variable in the estimated migration equation (Blanco, 1963; Muth, 1971). Others have found the variable to be strongly correlated with net migration (Olvey, 1972; Greenwood, 1973). Employment growth, of course, serves as good proxy for Fields' turnover variable.

Lowry, examining 1950-60 migration for 52 of the largest SMSA's, calculated that an increase in the ratio of employment to working age population significantly encouraged net in-migration into an area. But some researchers have computed a positive relationship between employment growth and the out-migration rate. Edward Miller (1973) contended that the failure to control for the propensity to migrate accounts for the failure of these researchers

to compute a significant and negative correlation between employment growth and the out-migration rate. Investigating the determinants of out-migration from Standard Metropolitan Statistical Areas (SMSA's), and controlling for the propensity to migrate with the use of the in-migration rate as an independent variable, Morgan (1976) found that the variable, employment growth, was highly significant and possessed the expected sign.

And in their disaggregate and aggregate models, Navratil and Doyle (1977), found a significant and positive correlation between employment growth over the period 1965-70 and the in-migration rate for their aggregate model and the propensity to migrate for their disaggregate model.

Researchers recognizing the dearth of good data on job vacancies have utilized some measure of employment growth as a proxy for job opportunities in a labor market (Greenwood, 1973). Greenwood argued that the ratio of employment to population of work force age provided a more representative index of labor market tightness within a labor market. He contended that where the labor force participation rate is wage rate elastic, the unemployment rate becomes very dependent upon prices and wages. This effect is minimized when the employment index [hereafter referred to as the employment pressure index (EPI)] is employed. This study will employ this index as a measure of slack or tightness within a local labor market.

This index has served to successfully capture tightness within the local labor market in several studies. Researchers at Oak

Ridge National Laboratory (Olsen, et al., 1977) have employed this index to project regional economic and demographic changes. They found the index to perform adequately as a proxy for labor market opportunities within the local labor market.

And Schlottmann and Herzog (1982), employing a variant of this index,⁷ found that, as expected, a larger work force relative to employment encourages out-migration from a region. The coefficient of the employment pressure index was positive and statistically significant.

Tenure. Specific training is defined by Becker (1964) as training that increases the marginal productivity of the worker in the training firm more than other firms. Thus, as an individual works for a firm, he/she, in many cases, acquires skills that are more valuable to his/her current employer than other potential employers. Ordinarily, the employer, in order to minimize the cost of turnover, will provide a premium for this skill even though it is not saleable elsewhere. Thus, one would expect to observe a negative relationship between job tenure and the propensity to migrate.

Donald Parsons (1972, p. 1121) demonstrated that:

Large investments in firm-specific human capital either by the firm or the worker are likely to lead to reduced labor mobility, since the economic cost of worker-job separations is increased.

⁷ Population of working age (14 or over) divided by the level of employment.

With a greater reluctance to leave a firm with the passage of time, one should then observe a negative relationship between employment tenure and the propensity to move geographically.

This study, utilizing months of tenure with the worker's current employer, will examine the impact of job tenure on the propensity to move. For some workers (primary), the variable tenure will pick up part of the negative or inhibiting force of the acquisition of job specific skills, while for others (secondary) tenure should prove less inhibiting.

Employment Status and Changes in Employment Status. Lansing and Mueller (1967) found that overwhelmingly, migrants gave economic and occupational reasons for moving. And not surprisingly, they found that individuals will be more prone to move with dramatic changes in employment status. These changes include: a) moving from employment to unemployment or vice versa, b) promotion or occupation upgrading within the firm, c) change in employers. Lansing and Mueller (1967), concluded that each of these is an important factor in explaining migration. They found that 18 percent gave reason (a) above as their motive for migration while 16 percent reported (b) and 17 percent voiced (c) as their motive for undertaking a geographic move.

In examining interstate mobility 1965-70, by age-cohort groups, Schroeder (1976) reported that of those individuals moving in the 25-34 age group, 46.5 percent were changing occupations (at

the one digit level). This figure declined to 33.5 percent for the 45-64 age group.

Young migrants as opposed to older migrants give unemployment or job search more frequently as a reason for migration (Lansing and Mueller, 1967). Saben (1963) found the correlation between employment status and migration much stronger among the young than the old. However, Schlottmann and Herzog (1981) found no evidence to support this age/employment status association in the estimated migration equation. In a subsequent study, Schlottmann and Herzog (1982) found that for the primary (first-time) and repeat migrant, unemployment increased the probability of migration by nine and eighteen percent, respectively.

Unemployed workers, of course, possess no employer specific job skills. The acquisition of these skills should reduce the probability that an individual will migrate. Employment results in the procurement of valuable skills and expertise that are non-transferrable. The most trivial of these skills would be the learning of supervisors' and subordinates' names. Also these unemployed workers have no pension rights or other benefits that would be lost with a geographic move. In many cases these benefits can become a substantial part of a worker's accumulated wealth.

Most previous studies have accounted for this bind to the local labor market by including a dichotomous variable to capture the worker's employed/unemployed status. This study will employ such a variable. However, it is likely that the elasticity of this

variable in the estimated migration equation will be lower with the inclusion of the variable, tenure.

Geographic mobility studies have provided both policymakers and researchers with bountiful evidence of varying propensities to migrate among various occupations. Many studies have demonstrated that migration is motivated primarily by the search for occupational opportunity and that its volume and direction are influenced by work possibilities. However, no study has examined geographic mobility in the context of the dual labor market. No study has attempted to examine the geographic mobility of such broad sociological classes as primary and secondary workers. This study attempts to fill that void.

CHAPTER III

HYPOTHESES TO BE TESTED AND METHODOLOGICAL FRAMEWORK

The purpose of this study is to examine geographic mobility in the context of a stratified labor market. This chapter will first identify and discuss the hypotheses to be tested. Second, it will delineate the methodological framework to be employed in these tests.

Hypotheses to Be Tested⁸

Hypothesis One--The propensity to migrate varies significantly among members of the respective segments or tiers. It is hypothesized that tier three workers (secondary workers) will display the greatest tendency to move geographically while tier two workers (lower tier, primary workers) will manifest the greatest reluctance to move. Tier one workers are expected to exhibit a higher propensity to move than tier two workers but a lower propensity to move than tier three workers.

The primary and secondary segments are differentiated primarily by stability, or lack of stability, of workers and jobs in the respective segments (Reich, Gordon & Edwards, 1973, p. 359). Since jobs in the secondary sector are characterized by the provision of little job specific skills, poor working conditions and little attachment between the worker and the job or firm, one would

⁸ For each of the hypotheses an α of .05 will be employed. α is the probability of failing to reject H_0 when it is false (Type II error).

expect workers in this segment to exhibit a readiness to move from one employer to another employer or into and out of the unemployed work force. Ceteris paribus, one would expect to observe a high correlation between this change in work place or employment status with changes in residence.

Workers in the primary sector, on the other hand, receive more job specific training, experience better working conditions and feel more of a sense of attachment to their current job or employer. This orientation or attitude is reinforced by the action of the internal labor market. The internal labor market tends to lock workers into a promotional ladder by rewarding those who remain with their current employer and by penalizing those who change employers. The most rigid version of the internal labor market model proposes that those who change employers must enter at the bottom of the training ladder, a port-of-entry, with their new employer. Thus, ceteris paribus, one would expect the primary worker to be much less geographically mobile than the secondary worker.

Additionally, within the primary sector, the workers in tier one should manifest a higher propensity to move, geographically, than members of tier two. These workers possess higher levels of education, and a higher percentage tend to work in occupations thought to exist in national markets when compared to workers in tier two. With a higher percentage of workers in what is normally thought of as blue-collar jobs, tier two workers will thus tend to accept an alternative job within the local labor market.

Hypothesis Two--Members of each segment respond differently to labor market tightness in regard to the migration decision. Ceteris paribus, it is hypothesized that secondary workers will display a greater employment tightness elasticity in the estimated migration equation.

Arthur Okun (1973, p. 208), in his seminal work, found that, "The demographic groups experiencing the largest proportionate increases in employment in a high pressure economy are secondary workers" Further, he found that the industries that experience the greatest increases in employment are the high wage industries. How does one resolve this apparent contradiction? What one observes, according to Okun, is a significant movement up the job ladder for the primary worker during a cyclical upswing or a tight labor market. This of course provides slots at the bottom of the ladder for entry by secondary workers. Thus, a tight labor market is more apt to change the employment status of the secondary workers as they move from unemployment to employment or from employment in the secondary market where internal labor markets are weak or non-existent to employment in the internal labor market. Additionally, since workers within the internal labor market or primary sector (tiers one and two) receive greater quantities of firm specific or job specific training, firms are reluctant to lay these workers off during a contractive labor market and they are likely to pay these same workers a premium in an expansive labor market in order to retain them (Parsons, 1972, p. 1121). Thus, one should observe that workers in tier one and tier two are more insulated from slack or tightness in the local labor market.

Investigating the structure of the internal labor markets within firms in Brazil, Morley, et al. (1979), sought to determine how firms adjust the management of their work force in the face of rapid growth in demand. Morley hypothesized that management would fill jobs requiring high levels of job-specific skills (idiosyncratic jobs) by promotion while these same managers would fill jobs with low skill requirements by outside hiring. And as expected, Morley, et al. established that industrial sector firms with extensive on-the-job training possessed job markets marked by restrictive entry.

In the United States, according to Morley, the supply of unskilled labor is probably quite elastic, thus variations in demand over the business cycle would likely have a larger impact on the labor turnover of the holders of unskilled positions rather than those who possess idiosyncratic jobs.

Concurring, Perry (1972, p. 259) estimated that a decline in the overall unemployment rate from five percent to four percent resulted in a reduction of two and one-half to three percentage points in the unemployment rate for teenagers, but a reduction of only .7 to .8 percentage points in the unemployment rate for mature males.

Relating this correspondence to the current analysis, one would expect to observe a much lower response on the part of holders of primary jobs to changes in employment pressure in regard to the migration decision.

But will members of tier one respond differently than members of tier two in regard to the migration decision? Morley contended that those occupations that are ordinarily thought of as requiring a great deal of investment in general skills (engineers, accountants, managers, etc.) will exhibit higher turnover rates than those who do not possess these high levels of general skills. Since tier one members possess higher levels of general skills, it is hypothesized that they will demonstrate a greater responsiveness to labor force tightness in making a migration decision than those members of tier two who possess lower levels of general skills. Thus, it is hypothesized that workers in tier three will exhibit the greatest elasticity followed by the tier one worker. Tier two workers, on the other hand, will exhibit the lowest elasticity when the propensity to migrate is regressed against labor force tightness.

Hypothesis Three--Equal months of tenure with an employer inhibit migration more among tier one and tier two workers than tier three workers.

Though there is no consensus among dual labor market theorists on what devices or factors account for labor market segmentation, most argue that secondary workers receive less on-the-job training. Instability among the work force accounts for this reticence on the part of the employer to provide training. As stated by Doeringer and Piore (1971, p. 152), "Because the work force is unstable the employer has no incentive to invest in training." Additionally they proposed that, ". . . the secondary employer is less reluctant to lay off a worker since he has made no real investment in his

training" (Wachter, 1974, p. 651). Continuing, "Employers in this sector, anticipating high turnover, hire workers without much prior screening, and provide little subsequent on-the-job training" (Wachter, 1974, p. 653).

Thus, tenure in the primary sector is more likely to be accompanied by more on-the-job training than an equal number of months of tenure in the secondary sector. Therefore, workers in the primary sector, recipients of job specific skills, will, ceteris paribus, be reluctant to move geographically since that move would likely entail a change of employers and a loss in bargaining position.

Also, longer tenure will be more likely to result in the accumulation of non-wage benefits such as pensions, vacation benefits, etc. for the primary worker. A geographic move by the primary worker would likely involve the loss of these benefits. On the other hand, secondary workers who receive less of these non-wage benefits would be less reluctant to move, other factors equal.

Methodological Framework

Introduction. The major methodological task in conducting an empirical investigation of labor market segmentation involves the definition of segments. Researchers have employed numerous and varied techniques. But dualists provide little guidance for the research worker who seeks to classify workers into appropriate sectors (Leigh, 1976, p. 156). In fact, no systematic technique

has been presented by the dualists to segregate workers by tiers. This study provides such an analytical technique and rescues sector designation from the amorphous, intuitive sphere that has marked all previous empirical research.

Most previous studies have relied upon characteristics of the worker as a method of categorization. However, the dual labor market theory [DLM] is a "job" or "demand" oriented research program (Wachter, 1974, p. 639). The DLM postulates a division or segmentation of the labor market based upon the characteristics of the job or market. Since data on job traits is either unreliable or unavailable, most studies have utilized the attributes of the worker as a proxy for job or workplace characteristics. This study will, likewise, utilize features of the worker as a method of distinguishing segments.

Promotion and Segmentation. Since a salient feature of the secondary sector is the lack of promotional opportunities (Wachter, 1974, p. 651), one could logically separate primary and secondary workers by including in the primary sector only those workers who have experienced a promotion during the time period being analyzed. If one can postulate that an increase in real wages accompanies a legitimate promotion, then secondary workers should exhibit a flat age/earnings profile.

. . . a more general test of the dual labor market thesis can be obtained by comparing age-earnings profiles of advantaged and disadvantaged workers to see if the former profiles rise more rapidly with age (Bosanquet and Doeringer, 1973, p. 423).

"Moreover because promotion is rare and high-wage employment impossible to find, secondary workers exhibit a flat profile of earnings across age groups" (Wachter, 1974, p. 653).

Accordingly, this study will utilize wage-upgrading as a device to categorize workers and to examine workplace segmentation. If a worker demonstrates, over the observation period (1969-1977), positive real income improvement, then this worker will be classified as a primary worker. Otherwise, the worker will be classified as a secondary worker.

The use of earnings improvement as a categorization device captures two important features of employment in the secondary sector--the lack of promotional opportunity and job instability.

The problem is that as a consequence of low wages, poor promotional possibilities and 'bad' jobs, individuals choose not to work steadily on any one job. Facing only low costs of specific training and turnover, employers, for their part, have no incentive to encourage stability (Wachter, 1974, p. 665).

Since the data set provides income from wages for a nine year period, income improvement was computed simply by averaging real wages for the first five years of the worker's income experience, (1969-1973), and comparing that average with the average real wage income for the final four years, (1974-1977).⁹

⁹In order to insure that the secondary sector does not include those who are simply moving from full-time to part-time work voluntarily or who are moving into or out-of the labor force, this study will consider only those workers who worked full-time or part-time when full-time work was desired.

This procedure, however, would likely result in the inclusion of most older workers in the secondary sector. Mincer and others conclude that most workers experience a decline in yearly income with many years of labor force experience even though these workers reside in what is typically thought of as the primary segment. In his pathfinding study, Mincer (1974) found that for most workers, real yearly income rises, reaches a peak, then begins to decline with years of work experience. Thus, to minimize the effect of this phenomenon, it is important to exclude these older workers from the study. The next section of this chapter discusses this phenomenon and presents a method of eliminating the effects of this feature of the worker's income experience in the categorization schema.

Age Earnings Profile. Jacob Mincer, one of the pioneers of human capital labor market theory, expounded what has come to be the theoretical foundation of applied research investigating the life cycle of worker's earnings. In his discussion of the earnings profiles of individuals, Mincer (1974, p. 70) stated that:

. . . except for the initial years of gainful activity, earnings are higher at higher levels of schooling and increase with age through much of the working life.

As the worker gains more labor force experience, one should observe steadily increasing income for the worker. This is due to the fact that the worker is constantly acquiring or purchasing training that increases his/her productivity and earnings. However, due to the limited years of working life, workers find it

less advantageous to increase their level of human capital as they approach retirement age. Therefore as the acquisition of human capital decays, earnings growth stops and may in some cases become negative. According to Mincer (1974, p. 28), "The absolute and more consistently, relative rate of increase in annual earnings diminishes with age, becoming negative, if it changes at all during the last decade of working life."

Mathematically:

$$k_t = k_o - bt \quad (1)$$

represents the decay of the stock of human capital with the passage of time where:

k_t = current dollar investment in human capital.

k_o = installment of investment during the initial year of work experience.

b = coefficient of decay.

t = time in years.

and Mincer demonstrated that the earnings function has the following form:

$$\ln P_t = \ln P_s + r_s S + r_p \sum_{t=1}^T k_t \quad (2)$$

where P_t = earnings in period t

P_s = what the individual would earn if he/she undertook no human capital investment.

r_s = rate of return to schooling

S = level of schooling

r_p = rate of return to post-school investment

Substituting (1) into (2), one obtains:

$$\ln P_t = \ln P_s + r_s S + r_p k_o T - \frac{br_p}{2} T^2 \quad (3)$$

Equation (3) is widely used to depict a worker's earnings profile. Consequently, with no additional schooling, the plot of a worker's yearly earnings should be parabolic in shape when yearly earnings are plotted against years of labor market experience.

Intuitively, it seems perhaps unreasonable that earnings growth would level off or become negative for the older worker. However, Mincer contended that the prime reason for this observed leveling off or downturn in wages is due to the fact that older workers work less weeks per year than their younger counterparts. In fact, when hourly earnings are plotted against age there is no decline with age (Mincer, 1974, p. 71).

Therefore utilizing annual earnings improvement as a categorization scheme would likely place a high percentage of older workers in the secondary sector. This effect is mitigated somewhat in the current study since part-time workers are excluded. Nonetheless, it is still essential that these older workers be excluded from the study. Employing multiple regression, this study will determine mathematically the local maxima for income when income is regressed against years of labor force experience. All workers with accumulated labor force experience beyond this point will be excluded from the study.

Since there were an insufficient number of years of data to perform a time series analysis, a cross-section (1977) of workers

was employed. The point of maximum yearly income from wages was found to be at twenty-five years of full-time labor force experience. Thus, this study deleted from consideration all those workers who had more than twenty-five years of full-time labor force experience in the final year in the wage/improvement analysis (1977).

This local maximum was computed using a variant of the functional form suggested by Mincer (1974, p. 92). Table 1 below provides the estimated wage equation for the sample. Employing this equation, it was found that, holding education constant, wages reach a maximum at twenty-five years of labor market experience.

Other Excluded Workers. Additionally this study will exclude students, members of the military and workers who work part-time and do not desire full time work. For purposes of this study, all those who chose to work less than 32 hours per week were excluded. The work experience of the above individuals is likely to be dramatically different from other workers and their inclusion in the analysis could seriously bias the results of the study.

TABLE 1
WAGES AS A FUNCTION OF EDUCATION
AND LABOR MARKET EXPERIENCE

Dependent Variable--Log Real Wages 1977

Independent Variables	Coefficient	t-Value
Intercept ^a	7.5698	104.13
Educat77 ^a	.0916	18.46
YR-Exp77 ^a	.0507	15.58
YR-Exp-Sq ^a	-.0010	16.43

$$R^2 = .135$$

^aStatistically different from zero at the 99 percent level of confidence.

where

Educat77 = Years of formal education as of interview date in 1977.

YR-Exp77 = Years of labor market experience as of interview date in 1977.

YR-Exp-Sq = YR-Exp77 squared.

For example, most college students would likely demonstrate habits and characteristics very similar to those of traditional secondary workers. However, it is unlikely that these same peripheral workers will remain so tenuously attached. It is more probable that the secondary sector is only a "way station" for these workers as they journey to their primary sector job.

Division of Primary Sector. This study will divide the primary sector into two tiers as proposed by Piore (1975). Piore divided the labor market into three groups: secondary workers as usually defined, plus a primary sector consisting of upper tier jobs in which workers enjoy a high degree of autonomy and experience personal participation in the work process, and lower tier jobs in which workers possess little autonomy and experience minimal participation in the work process.

In Piore's upper-tier primary, workers tend to possess more job control and individual work-place experience is more closely related to formal education and personal achievement than in the lower-tier primary where jobs are highly systematized. In a broad sense the lower tier consists mainly of what are regarded as well-paid, blue-collar jobs while the upper tier is constituted of workers who are normally thought of as professional or white-collar employees (Piore, 1975).

The data set employed in this study, the Income Dynamics Panel (IDP), provides a variable that captures the degree of autonomy enjoyed by a worker--the number of times the worker's

supervisor checks his/her progress during the week. This study postulates that primary workers who experience a minimum of one supervisory check per day have little autonomy and should be categorized as primary/subordinate or lower-tier primary. Those primary workers who receive very little supervision (supervisor checks progress less than once a day) will be classified as primary/autonomous or upper-tier primary.

Validity of Classification Technique. Two methods will be used to test the validity of the classification technique. First comparisons will be made statistically between those variables with predicted differences as postulated by the dual labor market model. As a second test, this study will employ discriminant analysis to test whether the categorization scheme provides segments or tiers that are consistent with the DLM. Finally, the author will compare this study's classification method with other accepted methods to demonstrate the superiority of earnings improvement and autonomy as variables for classification into meaningful segments.

The Spatial Dimension. Harrison and Hill (1979) have demonstrated that as a consequence of a changing mix of primary versus secondary jobs, some labor markets, particularly those of the Northeastern cities, have exhibited increasing instability. This, of course, could result from differential migration patterns of the primary and secondary workers. With worsening economic conditions, many have abandoned those areas along with their employers. According to Sjaastad (1961, p. 51), ". . . gross migration reflects

the degree to which the labor force is being reshaped by changing demand and supply conditions among industries."

But has this reshaping been the consequence of a higher propensity of the "elite" of the labor force to move? As outlined in the introduction, it is hypothesized by this study that the exact opposite has transpired. This study will examine these migration issues and discuss possible policy implications.

Combining counties into meaningful labor markets, this study is able to identify geographic residence by BEA area for each year 1969-1977. A move then is only recorded when a worker's residence differs at the time of the current interview relative to the residence provided at the time of the prior year's interview. Inter-county, intra-BEA moves will not be counted as a geographic move.

With geographic moves and tiers identified, it remains a straightforward task to test the differential mobility patterns among the separate tiers. Both intercept and interactive dummy variables will be employed to test the hypotheses stated earlier.

CHAPTER IV

DATA, EMPIRICAL MODELS, AND ESTIMATION TECHNIQUE

The Data

In their article investigating the effects of aggregation on the estimated migration equation, Navratil and Doyle (1977, p. 1553) concluded that the use of a highly aggregated model ". . . seriously distorts, or at least masks, some of the factors important to the individual's decision to migrate." Accordingly, this aggregation accounts for much of the measured migration response that has been inconsistent with economic theory. As stated by Greenwood (1975, p. 401):

Conclusions drawn on the basis of information on the population as a whole may well not apply to various populations or labor force subgroups.

By employing a micro data set, this study is able to utilize actual characteristics of individuals rather than averages which may or may not be representative of the individual. Consequently, this study should more clearly delineate the migration response of individuals to various stimuli than many past studies that used regional averages. Moreover, this study, utilizing a one year time span, as opposed to the more often employed five year interval, will more adequately capture the characteristics of the migrant at the time of the move and will capture circular moves that are often missed when utilizing a longer time interval.

Due to the categorization scheme and the tests to be employed, it was essential that one obtain labor market, demographic, and migrational data on an individual basis. The following data were needed: longitudinal income of worker, labor market experience, length of tenure with current employer, employment status, age, education, place of residence by labor market area, place of birth by labor market area.

The Income Dynamics Panel (IDP), compiled by the Institute for Social Research (ISR) at the University of Michigan, provides each of the aforementioned variables. The IDP data proves superior to other data sources in a number of respects. The IDP provides both cross-sectional and time series data. Since this study employs earnings improvement as a method of categorization, longitudinal data is an essential first ingredient. The ISR interviews respondents each year, thus dynamic variables are less dependent upon memory and can more accurately reflect the labor market/migration history of the worker.

In addition, due to the relatively long time span of the data (nine years), one can more adequately investigate the influence of the business cycle on employee upgrading and migration behavior.

Another strength of this data set is that the IDP provides a level of detail that is far superior to most other data sources [e.g. Social Security Administration's Continuous Work History Sample (CWHHS)]. For example, the IDP supplies residence of the individual by county, age of respondent, education, home ownership

status, income from wages, occupation, industry, etc. No other data set to the author's knowledge provides such detailed labor market/migration data.

In addition, the Institute for Social Research interviews a very large number of workers. Thus it was possible for this study to isolate approximately 3,200 workers who were interviewed each year over the entire span of the study. That is, families that experienced changes in the head-of-household were deleted from the data set. And unlike most longitudinal surveys, the IDP provides information on those respondents who move.

Additional data were needed to measure labor force tightness within each BEA. This study utilized Long Term Projections of Population and Employment for Regions of the United States provided by Oak Ridge National Laboratory to measure employment pressure within each labor market (BEA).

The following workers or heads-of-household (only heads-of-households were examined) were deleted from the data set:

- a. Heads-of-household who were not part of the sample for at least six years.
- b. Heads-of-household who were in the military during any year of the period 1969-77.
- c. Workers who had zero wages in any year 1969-77.
- d. Workers with more than twenty five years of work experience. (See methodology pages 52-58 for a discussion.)

- e. Workers who chose to work less than thirty-two hours per week during any year 1969-77.
- f. Workers who were less than sixteen years of age in 1969.
- g. Self-employed during any year 1969-77.

Table 2 below compares the migrant with the non-migrant for selected labor market and demographic variables.

TABLE 2
DIFFERENCES IN PERSONAL CHARACTERISTICS BY
MIGRATION STATUS, 1977-1978

	Nonmigrants	Migrants
Mean Age--1977 ^c	35.20	32.95
Mean Years of Formal Education--1977 ^c	12.41	13.27
Mean Level of Real Wages for 1977	\$10,481.78	\$11,166.15
Average Number of Prior Moves 1969-1977 ^a	.30	1.29
Average Number of Months With Current Employer--(1977 and Prior) ^a	86.70	51.15
Mean Hours of Unemployment 1977	49.53	105.85
Mean Years of Labor Market Experience--1977 ^b	12.97	10.56
Number of Observations	1159	41

^aSignificantly different from each other at the 99 percent level of confidence.

^bSignificantly different from each other at the 95 percent level of confidence.

^cSignificantly different from each other at the 90 percent level of confidence.

The Models

Doubtless two of the most important factors affecting the migration decision of the individual involve workplace changes and worker's employment status (length of tenure 0-300 months). And certainly critical junctures in the worker's employment history could be identified ex post as catalysts for geographic mobility. These would include promotion, change in employers and change in occupations. By incorporating these variables into the models, this study will be able to analyze factors that precipitate geographic mobility that have received little attention or consideration in past migration studies.

Additionally, this study will incorporate other variables into the analysis in order to capture the psychic constraints to geographic mobility. These include education, age, prior mobility and home ownership. Other common variables affecting geographic mobility such as earnings of the individual and employment tightness in the home region, will also be included.

This study will employ the following models to test the previously stated hypotheses and to test the viability of the categorization scheme:

Model H-0:

$$P_{ik} = f(\text{Tight77, DProm, DCh-Emp, DCh-Oc, Tenure77, RWag77, Age77, Educat77, DUnem77, DBrthbea, DHome77})$$

Model H-0 will be referred to subsequently as the control model.

Models H-1a, H-1b, H-2, H-3 will be employed to test hypotheses numbers one, two and three respectively.

Model H-1a:

$$P_{ik} = f(\text{DTier1}, \text{DTier2}, \text{Tight77}, \text{DProm}, \text{DCh-Emp}, \text{DCh-Oc}, \text{Tenure77}, \text{RWag77}, \text{Age77}, \text{Educ77}, \text{DUnem77}, \text{DBrthbea}, \text{DHome77})$$

Model H-1b:

$$P_{ik} = f(\text{DTier1}, \text{DTier2}, \text{Tight77}, \text{DProm}, \text{DCh-Emp}, \text{DCh-Oc}, \text{Tenure77}, \text{RWag77}, \text{Age77}, \text{Educ77}, \text{DUnem77}, \text{DBrthbea}, \text{DHome77}, \text{DProf77})$$

Model H-2:

$$P_{ik} = f(\text{DTier1}, \text{DTier2}, \text{Tight77}, \text{ITight1}, \text{ITight2}, \text{DProm}, \text{DCh-Emp}, \text{DCh-Oc}, \text{Tenure77}, \text{RWag77}, \text{Age77}, \text{Educ77}, \text{DUnem77}, \text{DBrthbea}, \text{DHome77})$$

Model H-3:

$$P_{ik} = f(\text{DTier1}, \text{DTier2}, \text{Tight77}, \text{DProm}, \text{DCh-Emp}, \text{DCh-Oc}, \text{Tenure77}, \text{ITenure1}, \text{ITenure2}, \text{RWag77}, \text{Age77}, \text{Educ77}, \text{DUnem77}, \text{DBrthbea}, \text{DHome77})$$

where

$$P_{ik} = \begin{cases} 1 & \text{A dichotomous variable equal to one if the individual, k, lived in BEA area i in 1977 and some other BEA area in 1978; zero otherwise.} \\ 0 & \end{cases}$$

Tight77	=	Employment pressure index; ratio of total employment in BEA area in 1977 to the population of work force age in the BEA area in 1977.
DProm	=	A dichotomous variable equal to one if the worker reported a promotion between 1977 and 1978; zero otherwise.
DCh-Emp	=	A dichotomous variable equal to one if the worker reported a change in employers between 1977 and 1978; zero otherwise.
DCh-Oc	=	A dichotomous variable equal to one if the worker reported a change in occupation between 1977 and 1978; zero otherwise.
Tenure77	=	Number of months that the employee has worked for his/her current employer as of interview date 1977.
RWag77	=	Real income from wages in 1977.
Age77	=	Age in 1977.
Educat77 ¹⁰	=	A discrete variable utilized to reflect years of formal education received by worker as of interview date, 1977.

¹⁰ The use of this discrete interval presumes that the completion of each level of education has an equal impact on the probability of moving.

- = 0 Less than eight years of formal education.
- = 1 More than or equal to eight years of education but less than twelve years of education.
- = 2 High school graduate (12 years of education).
- = 3 More than twelve years of education but less than fourteen years of schooling.
- = 4 Fourteen years of education.
- = 5 More than fourteen but less than sixteen years of education.
- = 6 College graduate (sixteen years of school).
- = 7 More than sixteen years of formal education.

DUnem77 = A dichotomous variable equal to one if the worker is unemployed at time of interview, 1977; zero otherwise.

DBrthbea = A dichotomous variable equal to one if individual, k, lived in a different BEA area in 1977 than the one in which he/she was born; zero otherwise.

- DHome77 = A dichotomous variable equal to one if individual, k, owns his/her own home; zero otherwise.
- DProf77 = A dichotomous variable equal to one if the worker is a professional; zero otherwise.
- DTier1
(DTier2) = A dichotomous variable equal to one if the individual, k, is a member of tier one (two); zero otherwise.
- ITight1
(ITight2) = Tight77 * DTier1 (DTier2)
- ITenure1
(ITenure2) = Tenure77 * DTier1 (DTier2)

In addition to the use of the above models to test the hypotheses presented earlier, this study will employ the following model to examine the viability of the categorization scheme:

Model V-1:

$$W_i = f(\text{Yr-Exp77, YrExpSq, Educat77, DRace, DSex, Tenure77, DProf, AnHrUn77, DUnion, Mantr, OtherSch, Tight77, DUrban, DFProf, DTier1, DTier2, DCore}).$$

where for those variables not defined above:

- W_i = Total real wages of worker in 1977.
- Yr-Exp77 = Years of work experience, 1977.
- YrExpSq = Years of work experience in 1977 squared.

DRace	=	A dichotomous variable equal to one if the individual is white; zero otherwise.
DSex	=	A dichotomous variable equal to one if the worker is male; zero otherwise.
AnHrUn77	=	Hours of unemployment, 1977.
DUnion	=	A dichotomous variable equal to one if the worker works under the terms of a union contract; zero otherwise.
Mantr	=	A dichotomous variable equal to one if the individual has received government job training; zero otherwise.
OtherSch	=	A dichotomous variable equal to one if the individual received business school training or formal training by the employer; zero otherwise.
DUrban	=	A dichotomous variable equal to one if the individual resides in an SMSA with city population greater than 100,000; zero otherwise.
DFProf	=	A dichotomous variable equal to one if individual's father was a professional worker; zero otherwise.
DCore	=	A dichotomous variable equal to one if worker is employed in an industry normally found in the core (primary) rather than

periphery (secondary); zero otherwise
(see Appendix Table A-1 for a breakdown
between core and periphery industries).

Estimation Technique

Until recently econometric studies used linear probability equations in qualitative response models. However, this technique provides no assurance that estimated probabilities will lie between zero and one. Of course, the dependent variable could be constrained to reside between zero and one. This procedure, though, produces kinks at the end points of the distribution of the dependent variable and there is no guarantee that the results will be unbiased (Pindyck, 1981, p. 241).

Kmenta (1971, p. 426) argued that the application of ordinary least squares will result in heteroscedasticity with its resultant inefficient estimators. One could correct this heteroscedasticity by applying weighted least squares estimation. However, this technique does not prevent the predicted value of the dependent variable from lying outside the (0, 1) interval.

In order to circumvent these problems, increasingly probit and logit functions have been employed. Both of these functions are automatically bound between zero and one. And it has been demonstrated that the probit and logit estimation techniques provide similar results. As stated by Amemiya (1981, p. 1487) ". . . in the univariate dichotomous model, it does not matter much whether one uses a probit or a logit model"

And because it is possible to prove that a unique maximum always exists for the logit function, maximum likelihood estimation provides the most appropriate estimation technique (Pindyck, 1981, p. 247).

This study will employ the logit model to obtain the maximum likelihood estimators. Thus the dependent variable becomes:

$$\log \frac{P_1}{1 - P_1}$$

where P_1 represents the probability that a worker will migrate. The Predict procedure of the Statistical Analysis System will be employed for estimation purposes.

In the case of the wage equation (Model V-1), ordinary least squares will be employed to obtain estimated coefficients.

CHAPTER V

EMPIRICAL RESULTS

This chapter presents the empirical results. The first section will discuss and statistically test the validity of the classification methodology. Other classification methods will be presented concurrently and compared to the method suggested by this study. The second section will present the empirical tests of hypotheses along with a discussion of how all variables entered the regression equations. Again these results will be compared for alternative methods of categorization.

Validity of the Categorization Scheme

In order to test these hypotheses, it is clear that an a priori classification of jobs within the two markets is necessary. It is therefore surprising that little systematic classification of jobs has occurred, and even further that rigorous testing of the few existing classifications is lacking (Lowell, 1978, p. 95).

Often valuable insight may be gained by analyzing the data in tabular form where ceteris paribus conditions are not fulfilled. In the tables that follow, the data will be analyzed by tier to determine if, in general, the categorization methodology provides tiers that are consistent with the dual labor market theory.

Importantly, one must be assured that the categorization design produces tiers among which the characteristics of the members meet a priori expectations. Otherwise, tests of differential reactions among members of the respective tiers become meaningless. Does the categorization scheme, as predicted by the dual labor

market model, provide tiers among which income, stability, promotional opportunities and working conditions are markedly different? Each of these features of the respective tiers will be examined and comparisons will be made among alternative classification schemes.

As outlined earlier, tiers one and two are composed of workers who are members of the primary work force. On the other hand, the secondary sector is represented by tier three. This division between primary and secondary sectors is based upon earnings improvement. The division of the primary sector into tiers one and two is based upon the degree of autonomy experienced by the worker. Those who experienced little supervision (autonomous) were placed in tier one while those who experienced close supervision (dependent) were placed in tier two. This scheme will be subsequently identified by (EI).

This method will be compared to two alternative programs of categorization. The first method used for comparison is that suggested by Osterman. That is, occupations will be designated as either tier one, tier two or tier three based upon judgment. Then workers are assigned to tiers based upon their reported occupation. This method will be subsequently referred to as (OC). A listing of the respective occupations by tier is depicted in Appendix Table A-2.

The second method utilized for comparison is a combination of (EI) and (OC). In this case, primary and secondary sectors are

formed based upon occupation. Next, the primary sector is subdivided into tier one (autonomous) and tier two (dependent) based upon the degree of supervision experienced by the worker. Hereafter, this method will be referred to as (OA).

It now becomes the task to determine which method provides tiers that more closely match those postulated by the dual labor market theorists. Does each of the classification techniques provide tiers among which income, stability, promotional opportunities and working conditions are significantly different?

Income. Most theorists who assume the existence of a segmented labor market contend that low wages distinguish employment in the secondary sector. And in his three tier model, Piore (1975) proposed that the average yearly wages of upper-tier, primary workers differ from that of lower-tier, primary workers. Piore contended that secondary workers would earn even less than workers in both tiers of the primary sector.

Osterman found evidence to support this trimodal distribution of income. In his examination of heads-of-household in 1967, he found an income distribution and tier structure in which wages in the secondary sector were 41.6 percent of those in the upper-tier primary while wages in the lower-tier primary were 58.1 percent of those in the upper-tier primary. He did not indicate if the results were statistically significant.

Table 3 below provides information regarding the distribution of income within each tier as designated by this study's methodology and as supplied by the alternative classification methods.

TABLE 3
MEAN INCOME FROM WAGES, 1978

	Tier One	Tier Two	Tier Three
Earnings Improvement (EI)	\$12,424	\$10,145	\$9,395
Occupation (OC)	14,406	10,039	7,635
Occupation/Autonomy (OA)	12,647	10,350	7,635
	Primary Sector		Secondary Sector
Earnings Improvement (EI)	\$11,329		\$9,395
Occupation and Occupation/ Autonomy (OC) and (OA)	11,215		7,635

Mean wages among tiers were significantly different at the 99 percent level of confidence for all three categorization techniques. Also mean wages in the primary sector were significantly different from mean wages in the secondary sector for both categorization methods (OC) and (OA). (OC) and (OA) provide identical primary and secondary sectors since for both schemes, the same criteria is used to place workers in the secondary sector (tier three). Those that are not placed in the secondary sector are placed in the primary sector.

Stability.

Secondary jobs do not require and often discourage stable working habits; wages are low; turnover is high; job ladders are few (Reich, 1973, p. 359).

The IDP provided several measures of employment stability. The two most comprehensive of these, hours of unemployment and number of

periods of unemployment, will more clearly reflect stability by tier. Table 4 which follows displays hours of unemployment by tier for the three different categorization schemes.

TABLE 4
MEAN HOURS OF UNEMPLOYMENT, 1978

	Tier One	Tier Two	Tier Three
Earnings Improvement (EI) ^{b,c}	26.8	31.9	63.6
Occupation (OC) ^{a,b}	15.4	43.9	52.7
Occupation/Autonomy (OA) ^b	30.2	37.9	52.7
	Primary Sector		Secondary Sector
Earnings Improvement (EI) ^d	29.2		63.6
Occupation and Occupation/ Autonomy (OC) and (OA)	33.8		52.7

^aIndicates that tier one and tier two are significantly different from each other at the 90 percent level of confidence.

^bIndicates that tier one and tier three are significantly different from each other at the 95 percent level of confidence.

^cIndicates that tier two and tier three are significantly different from each other at the 99 percent level of confidence.

^dIndicates that primary sector and secondary sector are significantly different from each other at the 99 percent level of confidence.

As expected, tier three workers experience greater hours of unemployment than workers in tiers one and two. However, this difference between tier three workers and workers in the other two

tiers is statistically significant only for the Earnings Improvement (EI) method of categorization and the difference between primary and secondary is only significant for the (EI) Categorization method.

Table 5 below provides further evidence of tier three workers' employment instability.

Again the results support the proposition that tier three workers are more prone to experience periods of unemployment than either tier one or tier two workers. However, when the results of the two alternative classification techniques are examined, the same conclusion can not be reached. In both cases, (OC) and (OA), tier two workers experienced more periods of unemployment than tier three workers.

Harrison (1979, p. 274) contended that employers' reluctance to lay off workers who have received extensive training accounts for this distinction. That is, employers having made substantial investments in training the primary worker wish to retain this worker in order to recoup the cost of such training. Thus, a priori, one would expect to observe longer training periods for primary sector workers. Table 6 below exhibits the mean value of the number of months that interviewees responded were necessary to learn to perform their current jobs.

TABLE 5
PERIODS OF UNEMPLOYMENT, 1976

	Tier One	Tier Two	Tier Three
Earnings Improvement (EI) ^a	1.5	5.0	8.3
Occupation (OC) ^a	.5	6.4	4.2
Occupation/Autonomy (OA) ^a	1.7	7.5	4.2

^aThese numbers do not represent actual periods of unemployment. The responses were coded by interviewer so that larger numbers indicate simply more periods of unemployment, not the actual number of periods.

TABLE 6

MEAN NUMBER OF MONTHS TO LEARN JOB

	Tier One	Tier Two	Tier Three
Earnings Improvement (EI) ^{a,b}	22.7	16.7	16.3
Occupation (OC) ^{a,b,c}	31.8	15.2	9.7
Occupation/Autonomy (OA) ^{a,b,c}	24.0	17.6	9.7
	Primary Sector		Secondary Sector
Earnings Improvement (EI) ^d	19.8		16.2
Occupation and Occupation/ Autonomy (OC) and (OA) ^e	21.0		9.7

^aIndicates that tier one and tier two are significantly different from each other at the 90 percent level of confidence.

^bIndicates that tier one and tier three are significantly different from each other at the 95 percent level.

^cIndicates that tier two and tier three are significantly different from each other at the 99 percent level of confidence.

^dIndicates that primary sector and secondary sector are significantly different at the 95 percent level of confidence.

^eIndicates that primary sector and secondary sector are significantly different at the 99 percent level of confidence.

For each of the classification techniques, tier three jobs appear to require less training than tier one or tier two jobs. However for the Earnings Improvement method of categorization, the results are not statistically significant. The next prominent feature distinguishing employment by sector, promotional opportunity, will be examined by tier and compared for the three alternative methods of categorization.

Promotional Opportunities. In the primary sector where internal labor markets are pervasive and strong, workers are likely to receive regular promotions. As stated by Wachter (1974, p. 643), "New workers are used principally to fill entry jobs, while most higher-level positions are filled by promotion from within."

In Tables 7 and 8 below, one can observe differential promotional patterns by tier and by sector for workers within the sample.

TABLE 7
PERCENTAGE WHO RECEIVED A
PROMOTION, 1977-1978

	Tier One	Tier Two	Tier Three
Earnings Improvement (EI) ^a	5.4	3.4	1.1
Occupation (OC) ^a	5.7	3.3	1.4
Occupation/Autonomy (OA) ^a	4.9	3.3	1.4

^aIndicates that responses were recorded in such a manner that statistical tests could not be performed.

TABLE 8
MEAN NUMBER OF MONTHS WITHOUT A
JOB PROMOTION, 1977

	Primary Sector	Secondary Sector
Earnings Improvement (EI) ^a	64.6	73.8
Occupation and Occupation/ Autonomy (OC) and (OA)	67.3	64.2

^aIndicates that primary sector and secondary sector are significantly different at the 95 percent level of confidence.

As expected and depicted in Table 7, a smaller percentage of tier three workers received a promotion for the period 1977-78. This proved true for each classification technique. However upon examination of Table 8, one observes results opposite to that expected in the case of the alternative classification technique. That is, secondary workers experienced a smaller mean value of months without a promotion in the case of (OC) or (OA) method of categorization.

Working Conditions. A fourth feature, poor working conditions, distinguishes employment in the secondary sector.

Good jobs make up the primary sector of the dual economy, while bad jobs and workers frozen out of the primary sector compose the secondary sector (Wachter, 1974, p. 638).

In Table 9 below, one can clearly see that, as expected, tier three workers, when changing jobs, tend to receive new jobs in

which they experience a reduction (or at least no improvement) in the perceived quality of the work environment.

TABLE 9
FOR THOSE WHO CHANGED JOBS, 1977-1978, PERCENTAGE
WHO WENT TO A JOB THAT WAS THE
SAME QUALITY OR WORSE

	Tier One	Tier Two	Tier Three
Earnings Improvement (EI)	17.5	10.7	37.0
Occupation (OC)	19.4	20.7	25.0
Occupation/Autonomy (OA)	22.5	16.9	25.0

Though no statistical tests could be performed, the difference among tiers appears to be dramatic, especially for the Earnings Improvement (EI) method of categorization.

The preceding statistics seem to support a stratified labor market. However, discriminant analysis provides a more comprehensive test of homogeneity within the labor market. As stated by Lowell (1978, p. 97), "The discriminant analysis technique is ideally suited to test the dual labor market theory."

Discriminant analysis is a statistical technique that utilizes a designated rule to assign sample observations to a population. This rule is provided by the researcher and is formulated according to a priori expectations about the population. From preassigned groups, maximum likelihood discriminant functions are produced. One function is produced for each group. These functions are

linear combinations of the designated explanatory variables. These functions are formed by maximizing the ratio of among group variation to within group variation (Lowell 1978).

A discriminant analysis should verify the existence of distinct groups within the labor market and it should detect whether the factors emphasized by the dualists as distinguishing sectors are legitimate differences. The dual labor market model postulates separation between primary and secondary workers according to wages, turnover, training and advancement. Several variables contained in the IDP adequately capture these characteristics by workers. However, since the technique requires the use of continuous variables, several important differences by tier could not be employed in the test. The following variables were used: Real Wages in 1977; Hours of Unemployment in 1977; Months of Tenure with Current Employer--1977; Months to Learn Job; Salary Upgrading. Tables 10 and 11 below depict the results obtained from discriminant analysis.

TABLE 10
PERCENTAGE OF WORKERS CORRECTLY
CATEGORIZED BY SECTOR

	Primary Workers	Secondary Workers	Overall
Earnings Improvement (EI)	96.5	60.5	88.3
Occupation and Occupation/ Autonomy (OC) and (OA)	96.1	9.6	80.7

TABLE 11
PERCENTAGE OF WORKERS CORRECTLY
CATEGORIZED BY TIER

	Tier One	Tier Two	Tier Three	Overall
Earnings				
Improvement (EI)	83.5	17.4	78.9	57.7
Occupation (OC)	51.2	74.0	15.3	56.9
Occupation/ Autonomy (OA)	87.2	6.7	22.5	45.0

As presented in both tables, the technique suggested by this study provides a methodology that more correctly classifies workers by tier and by sector than those provided by the two alternative techniques.

Overall, the data support the existence of a segmented labor market. And the tiers, in most cases, confirm the a priori expectations about the characteristics of the respective tiers. Additional support for the existence of segmentation within the labor market will be provided by an examination of the estimated wage equation. Employing Model V-1, one should observe higher wages for both tier one and tier two workers, ceteris paribus. And as reported in Table 12 below, wages for workers in tier one are \$2,039 higher than for workers in tier three while wages for workers in tier two are \$1,731 higher than for workers in tier three for the (EI) method of classification. Most all the variables are statistically significant and all enter the estimated equation with

TABLE 12

MODEL V-1--THE WAGE EQUATION

Dependent Variable-- W_1						
Independent Variables	Categorization by Earnings Improvement and Degree of Autonomy (EI)		Categorization by Occupation (OC)		Categorization by Occupation and Degree of Autonomy (OA)	
	Coefficient	t-Value	Coefficient	t-Value	Coefficient	t-Value
Intercept	-9090.536 ^a	-3.36	-6386.480 ^a	-2.36	-6403.640 ^a	-2.37
YrExp77	244.666 ^a	2.66	234.481 ^a	2.52	230.552 ^a	2.47
YrExpSq	-4.182	-1.30	-5.091	-1.56	-4.952	-1.52
Educat77	633.652 ^a	10.83	630.550 ^a	10.66	624.904 ^a	10.55
DRace	1196.818 ^a	4.14	1131.542 ^a	3.84	1132.639 ^a	3.85
DSex	3866.562 ^a	10.48	3813.396 ^a	10.15	3835.920 ^a	10.19
Tenure77	10.024 ^a	4.71	10.908 ^a	5.05	10.813 ^a	5.01
DProf	2050.492 ^a	5.67	--	--	1883.542 ^a	4.92
AnHrUn77	-3.701 ^a	-5.46	-4.396 ^a	-6.50	-4.366 ^a	-6.45
DUnion	991.103 ^a	3.50	917.804 ^a	3.18	926.838 ^a	3.22
Mantr	42.501	0.03	176.288	-0.11	-66.172	-0.04
OtherSch	74.521	0.22	49.335	0.14	51.875	0.15
TTight	1222.337	0.32	-756.822	-0.19	634.280	0.16
DURban	1298.208 ^a	4.85	1313.592 ^a	4.85	1284.952 ^a	4.74
DFFProf	285.512	0.65	344.482	0.77	348.813	0.78
DCore	1659.828 ^a	6.29	1649.597 ^a	6.12	1655.882 ^a	6.14
DTier1	2038.525 ^a	5.97	2638.692 ^a	5.87	887.340 ^a	2.24
DTier2	1730.735 ^a	5.02	621.449	1.75	467.590	1.24
RSQ = .456		RSQ = .439		RSQ = .440		

^a Statistically different from zero at the 99 percent level of confidence.

the expected sign. This proved true for all three methods of categorization. However, the results for the method advanced by this study appear more conclusive. The coefficients for the variables DTier1 and DTier2 are larger [except DTier1 for (OC) method of classification] and both are statistically significant at the 99 percent level of confidence when the (EI) method of categorization is employed.

All techniques, Occupational (OC and OA) and Earnings Improvement (EI), suggest a segmented labor market. However, each method provides tiers with very different sizes and characteristics. How then can one choose the most reasonable and accurate categorization technique?

First, one must be aware of the weaknesses of each method. The occupational method has several factors that mitigate its relevance. Importantly, the occupational breakdown is governed by tions, workers may be unsure which occupational code they fall under. Or the worker could be performing work under several occupational codes. For example, occupational code 16 applies to technicians in dental offices. And occupational code 75 applies to attendants in dental offices. It is likely that many would be unsure about which code they fell under.

Additionally assumed functions and responsibilities of the workers by occupation could be considerably altered by local conditions and technology. As stated by Loveridge and Mok (1980, p. 377):

In this process technological changes, which at macrolevel appear to be the long-term source of occupational change, are mediated by local circumstances, including the strength of vested interest represented by local workgroups. For this reason the attempt by economists to define and to categorize "tasks" by standardized categories appears fraught with difficulty.

Additionally, the dual labor market model deals with behavior over time. Thus, using the static concept of occupation says nothing about upgrading and feedback mechanism that can only be examined properly by observing the worker's labor market experience over time.

Of course Earnings Improvement (EI) as a categorization technique possesses several weaknesses. Ignoring the level of wages is likely to place some workers in the "incorrect" tier. In other words, a person who earns \$50,000 but experiences no improvement in wages is an unlikely candidate for the secondary sector. Also, voluntary withdrawals from the work force could result in the inclusion of the worker in the secondary tier even though he/she otherwise would be regarded as a primary worker.¹¹

So what conclusions may be reached regarding the most appropriate categorization program? Considering the conceptual weaknesses of each technique and the results of the statistical tests, Earnings Improvement (EI) appears to offer the most useful method of classification. The statistical tests and discriminant analysis indicate that using Earnings Improvement/Autonomy as a

¹¹ This effect is minimized in this study since workers who averaged less than thirty-two hours per week are deleted from the sample.

categorization technique generates tiers and/or sectors that are more consistent with a priori notions about the segmented labor market. The technique provided by this study more correctly categorizes workers into respective tiers (as judged by discriminant analysis) and except for one measure (Table 6--Mean Number of Months to Learn Job), Earnings Improvement provides a classification that more clearly meets expectations about differences among the tiers.

The next section will examine the empirical results and test each of the hypotheses utilizing the categorization technique suggested by this study and employing the two alternative methods.

Empirical Results from Estimated Regression Equations

The control model (Model H-0) (no differentiation by tier) is presented on Table 13 below. The first part of this section will discuss each of the variables in the estimated regression equation where tier membership is not controlled for and, when appropriate, comparisons will be made among tier members regarding differential reaction to the control variables. This comparison will be made by running separate regressions for each tier (Model H-0, Table 14). The second part of this section will then examine the empirical tests of hypotheses (Models H-1, H-2, and H-3).

Age. As expected, the data confirm that additional years of age inhibit geographic mobility. However, the coefficient of the

TABLE 13

MODEL H-0--PROBABILITY OF MIGRATION WITH
NO CONTROL VARIABLES FOR TIER

Dependent Variable--Log (P/1-P)		
Independent Variables	Coefficient	t-Value
Intercept	12.210 ^a	3.136
Tight77	12.246 ^b	2.152
DProm	2.152 ^a	3.788
DCh-Emp	2.049 ^a	4.763
DCh-Oc	-.379	-.899
Tenure77	-.005	-1.281
RWag77	5.302*10 ⁻⁵ ^b	1.956
Age77	-.016	-.610
Educat77	.063	.718
DUnem77	.836	1.204
DBrthbea	1.254 ^a	3.268
DHome77	-1.310 ^a	-3.381

^a Statistically different from zero at the 99 percent level of confidence.

^b Statistically different from zero at the 95 percent level of confidence.

variable is insignificant in the regression equation using pooled data where tier membership is not controlled for (Model H-0, Table 13).

Home Ownership. In the estimated regression on the pooled data (Model H-0, Table 13), home ownership reduced the geographic mobility of workers. In fact this variable was the second most important variable in terms of explanatory power in the estimated equation and in terms of elasticity.

Prior Mobility. Of course past migration (currently living in BEA area other than BEA area of birth) not only increases the information that individuals have about other geographic areas, it reduces the psychic costs of a move. That is, it reduces the attachment that one feels for his/her community relative to other communities. Thus, it is not surprising that this variable possesses a positive coefficient and is statistically significant in the control model (Model H-0, Table 13) and in all other estimated regression equations or models.

When disaggregated by tiers and separate equations estimated, one can more clearly see differences among members of the three tiers.¹² Table 14 (Model H-0) below provides estimated equations for the separate tiers. The three psychic factors above impinge

¹²Workers are placed into tiers according to earnings improvement and degree of supervision (EI). These estimated regression equations are each simply the control model (Model H-0) applied to the separate tiers.

TABLE 14

MODEL H-0--THE PROBABILITY OF MIGRATION--INDIVIDUAL
REGRESSION EQUATIONS BY TIER

Dependent Variable--P _{ik}	Tier 1		Tier 2		Tier 3	
	Coefficient	t-Value	Coefficient	t-Value	Coefficient	t-Value
Intercept	-.113	-.64	.049	.40	-.904	-3.17
Tight77	.334	1.27	.049	.28	1.073 ^a	2.68
DProm	.137 ^a	3.52	-.028	-.82	.659 ^a	5.54
DCh-Emp	.058 ^a	2.01	.132 ^a	5.98	.090 ^a	2.46
DCh-Oc	-.028	-1.21	.004	.28	.011	.38
Tenure77	7.922*10 ⁻⁵	.52	-5.409*10 ⁻⁵	-0.48	-.0001	-0.65
RWag77	3.819*10 ^{-6a}	2.62	9.368*10 ⁻⁸	.06	-1.531*10 ⁻⁶	-0.47

TABLE 14 (Continued)

Dependent Variable--P _{ik}		Tier 1		Tier 2		Tier 3	
Independent Variables		Coefficient	t-Value	Coefficient	t-Value	Coefficient	t-Value
Age77		-.003 ^b	-2.10	-.001 ^b	-1.59	.003 ^b	1.87
Educat		-5.632*10 ⁻⁵	-.02	-.004 ^b	-1.38	.010 ^b	1.96
DUnem		* ---	---	.049	1.06	.076	1.36
DBrthbea		.036 ^b	2.10	.052	4.11	.014	0.54
DHome		-.077 ^a	-4.02	-.003	-0.24	.030 ^b	1.96

* Dropped due to no unemployed workers in tier one.

^a Statistically different from zero at 99 percent level of confidence.

^b Statistically different from zero at 95 percent level of confidence.

less on the workers' migration decision for those who are tier three workers: In fact the difference is dramatic.

For tier one and tier two workers (Model H-0, Table 14), each of the psychic variables possesses the expected sign and is statistically significant (except for home ownership in tier two). However, in tier three the coefficient for age, and the coefficient for home ownership are both unexpectedly positive and the coefficient for prior mobility is statistically insignificant at the 95 percent level of confidence.

This result, upon careful thought, is not surprising. Since tier three, or secondary workers, change jobs more frequently and see their job only as a means to an end, they are less likely to form cohesive groups at work which would likely inhibit mobility. That is "socialization" at the workplace is missing for the secondary worker. As stated by Piore (1975, p. 141):

In the secondary sector, for example, which is dominated by youth and by the disadvantaged, turnover tends to be too rapid to permit the formation of social groups in which custom is embedded.

Piore argued that in the primary sector, social groups do play an important part in the work environment. This socialization takes place irrespective of tenure with the current employer (though this variable certainly captures part of the effect and is included as a separate variable in each estimated regression equation).

In tier one, professional and social organizations probably tend to exert an inhibiting effect on geographic mobility as the

worker ages. Thus, age proves more inhibiting to geographic mobility to tier one workers. Additionally, it is likely that these individuals take a greater interest and participate in a more active manner in local civic organizations. Thus, home ownership will likely prove to be a more inhibiting factor to these potential migrants. In tier two this socialization could result from such occupational affiliations as labor unions.

Consequently, it is not surprising that psychic factors affect, to greater degree, the migration plans of tier one and tier two workers. As concluded by Sonnefield in a 1974 study of students from small communities in Texas, the propensity to migrate is inversely related to one's perceived attractiveness of his/her home community. It is hypothesized that this perceived attractiveness is more a function of age, home ownership and prior mobility for tier one and tier two workers. That is, longevity in the community [as captured by age and prior mobility (or lack of)] and the extent of community involvement (as captured by home ownership) are more influential factors in the migration decision making of primary workers (tiers one and two). Results from the estimated regression for the individual tiers (Model H-0, Table 14) appear to confirm this proposition.

Education. In the pooled data with no differentiation by tier, the coefficient of education possesses the expected positive

sign (Model H-0, Table 13, page 92). However, the coefficient is statistically insignificant.

When regressions are run on tiers individually, (Model H-0, Table 14, pages 94 and 95) one finds that the coefficient for education is positive and statistically significant only for tier three workers. For tier one and tier two workers, the coefficient is negative and statistically insignificant at the 95 percent level of confidence.

As proposed by Schwartz (1976), the market for the better educated is more national in scope than that for the poorly educated. It is suggested here that this differential by level of education is true only for tier three workers. For tier one and tier two workers this national/local perspective by education level is mitigated by the internal labor market. How workers learn about jobs in other areas and how workers view the size of the labor market for tier one and tier two workers are more a function of the internal labor market and are less related to education. In tier three, where internal labor markets are either weak or non-existent, workers who are better educated do tend to acquire better information about far-away opportunities than their less educated co-workers and tend to undertake a change in residence as they accept these jobs. Thus, the results from the estimated regressions on the separate tiers (Table 14) are not unexpected.

Income. Without controlling for tier, the coefficient for the variable, income, is positive and significant at the 95 percent level of confidence (Model H-0, Table 13, page 92). But when estimated equations for each tier are analyzed, dramatically different results are reported for the individual tiers (Model H-0, Table 14, pages 94 and 95).

While at the 99 percent level of confidence, income is positively correlated with the propensity to move for tier one workers, it is uncorrelated with the propensity to move for tier two workers and negatively correlated with the migration probabilities of tier three workers.

In past studies the measured effect of income on migration probabilities has been mixed, at best. Schlottmann and Herzog (1981) found real wages to positively affect the decision to migrate only for the unemployed worker who had not moved previously. Lansing and Mueller (1967), controlling for education, occupation and age concluded that there was no relationship between migration and income. And Ladinsky (1967) reported a negative relationship between migration and income when controlling for age, education and occupation.

It can be conjectured that past studies that have reported unexpected signs on the coefficient for the income variable have been picking up the effects of omitted variables. Thus, the coefficient

for income will be biased.¹³ As stated by Lansing and Mueller (1967, p. 78):

An additional problem is the tendency for income to be highly correlated with a number of major determinants of mobility, especially age, education, occupation and employment experience.

Since income and tenure (months with current employer) are positively correlated and since tenure is negatively correlated with the probability of moving, failure to include this variable in the regression equation will reduce the elasticity and statistical significance of the income variable if income and the probability of migration are positively correlated. This study, by including tenure, age, education and employment status as separate variables, should more clearly measure the relationship between income and the propensity to migrate.

Several factors account for income's influence on the migration decision. a) Higher income provides funds for transportation costs. b) Higher income provides funds for meeting living expenses during the time between jobs. c) Higher income increases the opportunity cost of time between jobs or of unemployment. Both (a) and (b) above would dictate a positive correlation between income and migration propensity while (c) above would warrant a negative relationship between income and migration probabilities.

When income from non-wage sources (interest, dividends, etc.) is included in the estimated regression equation as a separate

¹³ See Kmenta (1971), p. 393.

independent variable (Model H-0, Table 15 below),¹⁴ and one compares the coefficient for the variable 'RWag 77' in Model H-0, Tables 13 and 15, the coefficient for Rwag77 increases only slightly. This indicates that income's importance in a geographic move results from considerations other than transportation costs. It is quite likely that income is serving as a proxy for the ability to gather information about job opportunities in other labor markets. The higher the income, the better information secured by the potential migrant.

Unemployment. As expected, unemployed workers are more apt to undertake a geographic move. That is, the coefficient for the unemployment variable was positive. However for the control model (Model H-0, Table 13, page 92), the coefficient was statistically insignificant at the 95 percent level of confidence. Due to the distribution of unemployment among the tiers, comparisons of the impact of unemployment on members in the regression equations by tier would prove of little value.

Changes in Occupation. The coefficient for the binary variable, change in occupation, was both negative and statistically insignificant (See Model H-0, Table 13, page 92). This relationship proved relatively invariant to tier membership. That is, the coefficient for the variable representing occupational change was

¹⁴ This estimated regression equation is simply the control model with the addition of the variable 'other income'.

TABLE 15

MODEL H-0--THE EFFECT OF OTHER INCOME ON THE
PROBABILITY OF MIGRATION

Dependent Variable--Log (P/1-P)				
Independent Variables	With Other Income Included		With Other Income Not Included	
	Coefficient	t-Value	Coefficient	t-Value
Intercept	-12.220 ^a	3.139	12.210 ^a	3.136
Tight77	12.242 ^b	2.152	12.246 ^b	2.152
DProm	2.149 ^a	3.781	2.152 ^a	3.788
DCh-Emp	2.051 ^a	4.762	2.049 ^a	4.763
DCh-Oc	-.381	-.904	-.379	-.899
Tenure77	-.005	-1.274	-.005	-1.281
RWag77	5.334*10 ^{-5b}	1.965	5.302*10 ^{-5b}	1.956
Age77	-.016	-.593	-.016	-.610
Educat77	.064	.728	.063	.718
DUnem77	.836	1.205	.836	1.204
DBrthbea	1.249 ^a	3.242	1.254 ^a	3.268
DHome	-1.305 ^a	-3.360	-1.310 ^a	3.381
OtherInc	2.939*10 ⁻⁵	.134		

^a Statistically different from zero at the 99 percent level of confidence.

^b Statistically different from zero at the 95 percent level of confidence.

^c Statistically different from zero at the 90 percent level of confidence.

either negative or statistically insignificant in the regression equations for the separate equations (Model H-0, Table 14, pages 94 and 95).

The negative relationship between occupational change and geographic mobility or the lack of a statistically significant relationship between the propensity to migrate and occupational change follows from the fact that many changes in occupation take place among those who are the least geographically mobile (Tarver, 1964). Thus, in the labor market, there exists those who are highly mobile, geographically but experience few changes in occupation (the professional) and those who experience a great deal of occupational change but who move geographically very little.

Promotion. The data confirm the a priori, expected relationship between promotion and geographic mobility (See Model H-0, Table 13, page 92). And when regression equations are estimated for the separate tiers it is found that with the exception of the coefficient in the estimated regression equation for tier two workers, the estimated coefficient for DProm possesses the expected positive sign and is significant at the 99 percent level of confidence (Model H-0, Table 14, pages 94 and 95).

This lack of correlation between the probability of migration and promotion for tier two workers stems from the geographic dispersion of promotional opportunities for members of tier two workers. Tier two workers, as opposed to tier one and tier three workers, are more likely to be employed by large industrial firms

which are concentrated or less geographically dispersed. Thus, promotion will not likely elicit a geographic move for the tier two worker. If tier two workers do move for non-employment related reasons, it is likely that they will be required to change employers.

Change in Employers. As expected, a change in employers precipitates a geographic move on the part of the worker (Model H-0, Table 13, page 92). This result follows irrespective of tier membership (Model H-0, Table 14, pages 94 and 95). The coefficient for DCh-Emp is positive and significant at the 99 percent level of confidence for each of the tiers (Model H-0, Table 14, pages 94 and 95). In the estimated regression equation where tier membership is not controlled for (Model H-0, Table 13), this variable contributed the most in explaining variations in the dependent variable (highest F-value) and possessed the greatest elasticity.

Hypothesis One--Tier Membership and Geographic Mobility (Model H-1). Briefly, hypothesis one proposes that, due to the structure provided by the internal labor market, tier one and tier two workers are less geographically mobile, ceteris paribus. As hypothesized, tier one and tier two workers are, ceteris paribus, more reluctant to undertake a geographic move. In Table 16 below both binary intercept variables possess negative signs as expected. However, the coefficient for the variable designating membership in

TABLE 16

MODEL H-1a--PROBABILITY OF MIGRATION
CONTROLLING FOR TIER

Dependent Variable - Log (P/1-P)	Categorization by Earnings Improvement and Degree of Autonomy (EI)		Categorization by Occupation (OC)		Categorization by Occupation and Degree of Autonomy (OA)	
	Coefficient	t-Value	Coefficient	t-Value	Coefficient	t-Value
Intercept	-10.808 ^a	-2.705	-13.455	-3.188	-13.50 ^a	-3.264
DTier1	-.422	-.912	2.168 ^a	3.111	1.550 ^b	2.405
DTier2	-1.159 ^b	-2.159	.575	.924	.482	.734
Tight77	11.877 ^b	2.063	13.902	2.298	13.356 ^b	2.243
DProm	2.319 ^a	4.057	2.205 ^a	3.838	2.195 ^a	3.863
DCh-Emp	2.002 ^a	4.571	1.998 ^a	4.576	2.071 ^a	4.750
DCh-Occ	-.472	-1.105	-.302	-.705	-.291	-.688

TABLE 16 (Continued)

Dependent Variable--Log (P/l-P)						
Independent Variables	Categorization by Earnings Improvement and Degree of Autonomy (EI)		Categorization by Occupation (OC)		Categorization by Occupation and Degree of Autonomy (OA)	
	Coefficient	t-Value	Coefficient	t-Value	Coefficient	t-Value
Tenure77	-.004	-1.040	-.006	-1.509	-.006	-1.475
RWage77	$5.769*10^{-5}{}^b$	2.089	$4.248*10^{-5}$	1.414	$4.239*10^{-5}$	1.439
Age77	-.036	-1.217	-.021	-.767	-.022	-.841
Educat77	.040	.451	-.174	-1.581	-.010	-.115
DUnem77	.782	1.107	$1.242{}^b$	1.750	$1.352{}^b$	1.863
DBrthbea	$1.278{}^a$	3.307	$1.356{}^a$	3.454	$1.396{}^a$	3.550
DHome	$-1.365{}^a$	-3.483	$-1.394{}^a$	-3.530	$1.347{}^a$	3.439

^a Statistically different from zero at the 99 percent level of confidence.^b Statistically different from zero at the 95 percent level of confidence.

tier one is statistically insignificant. Thus, one may not reject the hypothesis that tier one and tier three workers possess similar probabilities of moving geographically, ceteris paribus.

This result is quite likely due to the fact that many tier one jobs disproportionately exist in what is thought of as a national job market. Though these workers do reside in an internal labor market, their high level of general skills and network of national job contacts encourage geographic mobility on their part. These networks are often identified with the professional worker. Thus, by inserting a binary variable to account for the professional component (See Model H-1b, Table 17 below), it is hypothesized that the intercept binary variable representing tier one workers will increase in absolute value and that the significance level or t-value will also increase.¹⁵ Though the coefficient of DTier1 remains statistically insignificant, when comparing Tables 16 and 17 (pages 105 and 106 and 108 respectively), one observes that the coefficient for DTier1 becomes more negative and the t-value increases dramatically. The coefficients for DTier1 in the two equations are statistically different from each other at the 95 percent level of confidence.

This tends to be the case irrespective of changes in employers, occupations or of promotional changes. That is, it appears

¹⁵ Since classification schemes (OC) and (OA) are formed utilizing occupation as the prime determinant of tier, inserting the variable, DProf, as an independent variable in the estimated equation produces a singular matrix and coefficients cannot be estimated.

TABLE 17

MODEL H-1b--PROBABILITY OF MIGRATION CONTROLLING
FOR TIER AND PROFESSIONAL/NONPROFESSIONAL

Dependent Variable--Log (P/1-P)		
Independent Variables	Categorization by Earnings Improvement and Degree of Autonomy (EI)	
	Coefficient	t-Value
Intercept	11.123	-2.645
DTier1	-.648	-1.339
DTier2	-1.031 ^b	-1.879
Tight77	12.931 ^b	2.142
DProm	2.353 ^a	4.062
Ch-Emp	1.912 ^a	4.298
Ch-Oc	-.425	-.985
Tenure77	-.004	-1.183
RWage77	5.119*10 ⁻⁵ ^b	1.714
Age77	-.043	-1.398
Educat77	-.177	-1.610
DUnem77	.978	1.385
DBrthbea	1.333 ^a	3.382
DHome	-1.415 ^a	-3.544
DProf	1.674 ^a	3.324

^aStatistically different from zero at 99 percent level of confidence.

^bStatistically different from zero at 95 percent level of confidence.

that tier one jobs, which are within an internal labor market, nonetheless bridge labor markets. This aside, the estimated regression equations appear to support the contention that the internal labor market, ceteris paribus, reduces the geographic mobility of those whose jobs are normally found within these markets.

The other two categorization schemes, (OC) and (OA), provide results inconsistent with a priori expectations. As exhibited by Model H-1, Table 16, tier one and tier two workers are more geographically mobile, ceteris paribus with the use of an occupational categorization scheme (OC or OA). This provides further evidence that the classification technique proposed by this study provides tiers that more closely match a priori expectations.

Hypothesis Two--Employment Pressure and Tier Membership (Model H-2). Briefly, hypothesis two states that members of each tier respond differently to labor market tightness in regard to the migration decision. Ceteris paribus, it is hypothesized that secondary workers (tier three) will exhibit a greater employment tightness elasticity in the estimated migration equation. In the pooled data with no differentiation by tier (Model H-0, Table 13, page 92), greater employment pressure within the region encourages migration from the region. At first glance, this appears to contradict a priori expectations. That is, with more employment opportunities relative to labor supply within the local labor market, one would expect to observe workers finding jobs within the local labor market with a consequent reduction in migration probabilities.

Miller (1973) contended that the failure to control for prior mobility accounts for the computation of an unexpected sign on the variable representing employment opportunity within the region and out-migration rates. But Olsen, et al. (1977) found that out-migration seems to respond to employment pressure as expected for persons less than thirty years of age. However, for those thirty years of age and older one observes contradictory behavior. This led Olsen (1977, page B-6) to report that ". . . some problems remain: (1) some of the variables especially growth in employment enter the relationship with consistently incorrect signs"

Thus, one may ask if the failure of the employment tightness variable or employment growth to enter the estimated equation with the expected sign is the result of: (1) combining age cohorts as suggested by Olsen, et al. or (2) failing to control for past mobility as disclosed by Miller? The results of this study suggest that it is neither. After controlling for age and past mobility the statistical regressions indicate that the failure to generate the expected sign on the employment tightness variable is due to the aggregation of dissimilar segments of the work force.¹⁶

As outlined in hypothesis number two, workers within an internal labor market (tiers one and two) are likely to react

¹⁶ Rather than controlling for age by employing the independent variable, age, in the estimated regression equation, Olsen, et al. estimated separate regression equations for each age cohort. Due to the size of the sample, a rigid test of Olsen's proposition could not be performed.

differently to employment pressure or excess demand pressure. The results bear this out.

As reported below for Model H-2, Table 18, tier one and tier two workers are less sensitive, or demonstrate less elasticity, in their migration decision to employment pressure. In fact the coefficient for the variable, 'Tight77', for tier two workers is negative while that for both tiers one and three is positive.

During rapid employment growth within a region, companies will first post openings for jobs so that employees currently working for the firm will get the first crack at them. As stated by Kerr (1954, p. 99), "Jobs are posted and all men who claim the necessary qualifications may compete. But this is still an internal sub-market to which persons outside the plant have little or no access."

The coefficient for the variable Tight77 takes on its largest positive value for tier three workers. Thus as hypothesized, it appears that for those regions experiencing employment growth, tier one and tier two workers, relative to tier three workers, tend to move up the promotion ladder with an accompanying greater reluctance to move geographically.

Since studies have indicated the importance of age in determining tier membership, perhaps Olsen's study rather than detecting differential responses to employment pressure by age was in fact observing differential response by tier or sector which is to some degree, a function of age.

TABLE 18

MODEL H-2--DIFFERENTIAL RESPONSE TO EMPLOYMENT PRESSURE
IN THE MIGRATION DECISION BY TIER

Dependent Variable--Log (P/l-P)	Categorization by Earnings Improvement and Degree of Autonomy (EI)		Categorization by Occupation (OC)		Categorization by Occupation and Degree of Autonomy (OA)	
	Coefficient	t-Value	Coefficient	t-Value	Coefficient	t-Value
Intercept	-19.959	-2.570	-5.112	-.499	-4.868	-.462
DTier1	9.732	1.019	-11.247	-.941	-8.086	-.690
DTier2	16.931	1.545	-5.372	-.447	-10.008	-.758
TTight77	25.292 ^b	2.261	1.631	.107	.637	.041
ITight1	-14.821	-1.064	19.764	1.117	14.226	.818
ITight2	-26.696 ^b	-1.650	8.717	.490	15.461	.791
DProm	2.425 ^a	4.196	2.241 ^a	3.874	2.189 ^a	3.845
DCh-Emp	2.035 ^a	4.638	2.033 ^a	4.650	2.093 ^a	4.805
DCh-Oc	-.550	-1.260	-.327	-.764	-.284	.673

TABLE 18 (Continued)

Dependent Variable--Log (P/I-P)	Categorization by Earnings Improvement and Degree of Autonomy (EI)		Categorization by Occupation (OC)		Categorization by Occupation and Degree of Autonomy (OA)	
	Coefficient	t-Value	Coefficient	t-Value	Coefficient	t-Value
Tenure77	-.003	-.917	-.006	-1.484	-.006	-1.478
RWage77	5.793×10^{-5} ^b	2.090	4.348×10^{-5}	1.440	4.413×10^{-5}	1.503
Age77	-.038	-1.301	-.022	-.800	-.023	-.865
Educat77	.040	.439	-.184 ^b	-1.652	-.015	-.157
DUnem77	1.033	1.408	1.336 ^b	1.864	1.459 ^b	1.970
DBrthbea	1.267 ^a	3.270	1.394 ^a	3.522	1.392 ^a	3.514
DHome	-1.341 ^a	-3.408	-1.389 ^a	-3.500	-1.361 ^a	-3.437

^a Statistically different from zero at the 99 percent level of confidence^b Statistically different from zero at the 95 percent level of confidence.

Hypotheses Three--Tenure and Geographic Mobility Among Tiers (Model H-3). Hypothesis three states that equal months of tenure with an employer inhibit migration more among their one and tier two workers than tier three workers. Tenure in the pooled data has the expected negative impact on mobility. However, the coefficient is statistically insignificant in the regression on the pooled data with no differentiation by tier (Model H-0, Table 13, page 92). Additionally since age and tenure are highly correlated (correlation coefficient = .459), multicollinearity reduces the t-values for both variables in the estimated regression equation.

The estimated regression equation for Model H-3 in Table 19 below demonstrates, as hypothesized, that longer periods of experience with an employer are more inhibiting to geographic mobility for the tier two worker. That is, the coefficient for ITenure2 is negative and statistically significant at the 90 percent level of confidence. However, the coefficient for the interactive variable for tier one, ITenure1, is statistically insignificant at the 95 percent level of confidence. In other words, tier one and tier three workers appear to react similarly to various levels of tenure in their migration decision. What factors account for this similarity?

Theoretically the outcome is not unexpected. As stated by Piore (1975, p. 126):

They (tier one workers) are also distinguished by the mobility and turnover patterns, which tend to more closely resemble those of the secondary sector; except in contrast to the patterns of that sector, mobility and turnover tend to be associated with advancement.

TABLE 19

MODEL H-3--DIFFERENTIAL RESPONSE TO MONTHS OF TENURE IN
THE MIGRATION DECISION BY TIER

Dependent Variable--Log (P/1-P)						
Independent Variables	Categorization by Earnings Improvement and Degree of Autonomy (EI)		Categorization by Occupation (OC)		Categorization by Occupation and Degree of Autonomy (OA)	
	Coefficient	t-Value	Coefficient	t-Value	Coefficient	t-Value
Intercept	-10.941 ^a	2.737	-13.358 ^a	-3.130	-13.337 ^a	-3.180
DTier1	-.722	-1.119	1.834 ^b	2.159	1.438 ^b	1.785
DTier2	-.321	-.467	.579	.740	.390	.473
Tight77	12.127 ^b	2.105	14.008 ^b	2.315	13.256 ^b	2.220
DProm	2.432 ^a	4.172	2.217 ^a	3.848	2.191 ^a	3.851
DCh-Emp	2.021 ^a	4.625	1.978 ^a	4.519	2.062 ^a	4.713
DCh-Occ	-.440	-1.034	-.298	-.695	-.296	-.695
Tenure77	-.003	-.624	-.103	-.690	-.010	-.546
ITenure1	.003	.466	.009	.418	.004	.230

TABLE 19 (Continued)

Dependent Variable--Log (P/I-P)						
Independent Variables	Categorization by Earnings Improvement and Degree of Autonomy (EI)		Categorization by Occupation (OC)		Categorization by Occupation and Degree of Autonomy (OA)	
	Coefficient	t-Value	Coefficient	t-Value	Coefficient	t-Value
ITenure2	-.022 ^b	-1.630	.003	.169	.004	.209
RWage77	5.953*10 ^{-5^b}	2.163	4.142*10 ⁻⁵	1.370	4.205*10 ⁻⁵	1.424
Age77	-.038	1.263	-.020	-.742	-.022	-.822
Educat77	.042	.461	-.172	-1.576	-.011	-.122
DUnem77	.513	.713	1.085	1.463	1.299 ^b	1.681
DBrthbea	1.335 ^a	3.433	1.384 ^a	3.505	1.394 ^a	3.536
DHome	-1.406 ^a	-3.526	-1.394 ^a	-3.510	-1.341 ^a	-3.416

^aStatistically different from zero at 99 percent level of confidence.^bStatistically different from zero at 95 percent level of confidence.

But Piore does not specifically identify the forces that account for this. It is apparent that there are two opposing forces at work. First, tier one workers, possessing jobs located in an internal labor market, are reluctant to move geographically as they travel up the promotional ladder with longer tenure. Thus, ceteris paribus, one would expect to observe less geographic mobility on the part of tier one workers with increased tenure.

But all other things do not remain constant with changing levels of tenure. With increasing tenure, the tier one worker enhances his/her marketability in other firms. That is, these workers gain general skills which can be sold to other firms. These skills, though they may be positively correlated with education, are separate and distinct and are not controlled for in the estimated regression equation.

This chapter has presented evidence to substantiate a division of the labor market based upon earnings improvement and job autonomy (EI). This classification method was compared to alternative methods employed in previous studies. It was concluded that the method advanced by this study provides tiers that more adequately reflect the characteristics of the segments as described by the dualists. Furthermore, results from the regression equations provide support for the hypotheses stated earlier. Chapter VI will discuss policy implications of these findings and conclude the study.

CHAPTER VI

POLICY IMPLICATIONS AND CONCLUSIONS

Policy Implications

Since manpower programs and technical training designed to induce occupational change sometimes elicit an otherwise unexpected spatial move on the part of the trainee, it is essential that policymakers more fully understand the impacts and determinants of migration among respective segments of the work force. Policy makers must integrate the empirically gained knowledge of labor or occupational mobility with that of geographic mobility. The two mobility types are inextricably connected.

And due to the fact that migrants only concern themselves with the private costs and benefits of a geographic move, government officials must insure that the resulting mobility does not adversely damage a community through externalities. These externalities, as pointed out by Romans (1974), include pecuniary, technical and market factors. That is, governments must recognize that large welfare benefits and costs may accrue to communities that experience either net in-migration or net out-migration.

Additionally, due to the selective nature of migration, the quantity and mix of public services may change dramatically with the departure or arrival of new workers and their families to a region. Countless studies have established the fact that migration responsiveness varies markedly among workers by education, income,

etc. This study has simply confirmed many of these expected relationships. However, this study, by considering the hierarchical nature of the workforce and its effect on the migration propensities of workers, has provided new considerations for the policymaker.

A primary question asked by policymakers and addressed by many researchers has been the question of efficiency. Has migration resulted in a movement toward equilibrium? Has migration served as a stabilizing factor in the United States' economy or has migration been part of the problem as suggested by Piore? Has migration, as advanced by Piore, prevented the formation of social bonds? Has migration dichotomized the work force into a stable group of primary workers (non-movers) and an unstable group of secondary workers (movers)?

Upon examining the estimated wage equation (Model V-1, Table 12 page 85) one can surmise several important factors that are relevant to policymakers. Importantly, after controlling for all factors suggested by the human capital theorists, wages in tiers one and two are statistically greater than those of tier three or the secondary worker. Additionally, the coefficients for two of the human capital variables [manpower training (Mantr) and other schooling (Othersch)] prove to be statistically insignificant at the 90 percent level of confidence in the estimated wage equation.

This study has confirmed the existence of segmentation within the labor market. Additionally, this study has established that a

categorization method that is able to capture the feedback phenomenon by analyzing a workers' experience over several years provides segments with very different characteristics than those provided by a more static criterion such as occupation. The technique advanced by this study categorizes workers into segments that more adequately reflect the features of the segmented labor market as postulated in the literature.

As a measure of upgrading or advancement in the labor market, policymakers have in the past used occupational changes as a proxy (Byrne, 1975; Sommers and Eck, 1977). This study has demonstrated that this is not an effective method of measuring upgrading or advancement in the workforce. Thus, those programs that aim simply at moving the worker into a more favored occupation are ignoring an important aspect of workplace deprivation. This certainly minimizes their effectiveness and in many cases dooms the programs to failure.

Conclusions

This study investigated segmentation within the labor market and examined how this segmentation affected geographic mobility. Specifically, this research looked at the relationship between the internal labor market and geographic mobility.

This first objective of the study was to provide a consistent, reliable method of categorizing workers into meaningful tiers. With the use of reliable, longitudinal data, this study was able to implement a more dynamic method of categorization than had been employed in prior studies.

By categorizing workers into tiers according to earnings improvement and job autonomy, this study was able to provide support for the existence of segmentation within the labor market. However, these tiers did not conform to the more rigid model of Osterman. Osterman (1977) found that secondary workers' earnings were not statistically affected by additional years of schooling. This study found that secondary workers were rewarded for additional years of schooling by receiving higher wages. Otherwise, characteristics of the workers in the separate tiers, as provided by this study, did conform to those postulated by the dual labor market theorists.

After successfully categorizing workers into meaningful tiers, this study was able to demonstrate that this stratification had a statistically significant effect on geographic mobility.

It was found that the internal labor market (the market occupied by tier one and tier two workers) inhibits the geographic mobility of these workers. Additionally, this study was able to document that the workers in the separate tiers are affected differently by employment pressure, tenure and psychic factors such as home and community ties.

BIBLIOGRAPHY

BIBLIOGRAPHY

- Alexander, A. J. Structure, Income and Race: A Study in Internal Labor Markets. Santa Monica: Rand Corporation Press, 1972.
- Alexander, A. J. "Income, Experience, and the Structure of Internal Labor Markets," Quarterly Journal of Economics, February 1974, Vol. 88, pp. 63-85.
- Alexander, A. J. "Income, Experience and the Structure of Internal Labor Markets," Journal of Economics, February 1977, Vol. 88.
- Alexander, K. O. "Dual Product Markets and Dual Labor Markets; Some Implications," Journal of Behavioral Economics, Winter 1976, Vol. 5(2), pp. 15-28.
- Amemiya, T. A. "Qualitative Response Models: A Survey," Journal of Economic Literature, December 1981, Vol. XIX, pp. 1483-1536.
- Andrisani, P. J. "An Empirical Analysis of the Dual Labor Market," Ph.D. dissertation, Columbus, Ohio State University, 1973.
- Arrow, K. J. "The Theory of Discrimination" in Discrimination in Labor Markets edited by O. Ashenfelter and Albert Rees, Princeton, N.J., Princeton University Press, 1973, pp. 3-33.
- Bancroft, G. and S. Garfinkle, "Job Mobility in 1961," Monthly Labor Review, August 1963, Vol. 86, pp. 21-27.
- Barnes, W. F. "The Willingness of Unemployed Jobseekers to be Occupationally Flexible Downward or to be Retrained," Quarterly Review of Economic Business, Summer 1973, Vol. 14(2), pp. 75-84.
- Barrett, N. S. and R. D. Morgenstern. "Why Do Blacks and Women Have High Unemployment Rates?," Journal of Human Resources, Fall 1974, Vol. 9(4), pp. 452-464.
- Bartel, A. P. "Specific Training and Its Effects on the Human Capital Investment Profile," Southern Economic Journal, October 1977, Vol. 44(2), pp. 333-341.
- Bartel, A. P. "The Migration Decision: What Role Does Job Mobility Play?," American Economic Review, December 1979, Vol. 69(5), pp. 777-786.

- Bass, B. M. and R. A. Alexander. "Climate, Economy and the Different Migration of White and Nonwhite Workers," Journal of Applied Psychology, December 1972, Vol. 56 pp. 518-521.
- Beck, E. M., P. M. Horan and C. M. Tolbert. "Stratification in a Dual Economy: a Sectoral Model of Earnings Determination," American Sociological Review, October 1978, Vol. 43 pp. 704-720.
- Becker, G. S. Human Capital: A Theoretical and Empirical Analysis. New York: Columbia University Press, 1964.
- Berger, S. and M. J. Piore. Dualism and Discontinuity in Industrial Societies. Cambridge: Cambridge University Press, 1980.
- Bibb, R. and W. H. Form. "The Effects of Industrial, Occupational, and Sex Stratification on Wages in Blue-Collar Markets," Social Forces, June 1977, Vol. 55(4), pp. 974-996.
- Blanco, C. "The Determinants of Interstate Population Movements," Journal of Regional Science, Summer 1963, Vol. 5(1), pp. 77-84.
- Bluestone, B. "The Tripartite Economy: Labor Markets and the Working Poor," Poverty and Human Resources Abstracts, July/August 1970, Vol. 5(4), pp. 15-35.
- Bosanquet, N. and P. B. Doeringer. "Is There a Dual Labour Market in Great Britain?" Economic Journal, June 1973, Vol. 83(330), pp. 421-435.
- Bowles, S. S. "Migration as Investment: Empirical Tests of the Human Investment Approach to Geographical Mobility," Review of Economics and Statistics, November 1970, Vol. 52(4), pp. 356-362.
- Byrne, J. J. "Occupational Mobility of Workers," Monthly Labor Review, February 1975, Vol. 98(2), pp. 53-59.
- Cain, G. C. "The Challenge of Dual and Radical Theories of the Labor Market to Orthodox Theory," American Economic Review, May 1976, Vol. 65(2), pp. 16-22.
- Carnoy, M. and R. W. Rumberger. Segmented Labor Markets: Some Empirical Forays. Palo Alto: Center for Economic Studies, Stanford University, Discussion Paper 75-2.
- Cebula, R. J. and R. K. Vedder. "A Note on Migration, Economic Opportunity and the Quality of Life," Journal of Regional Science, August 1973, Vol. 13(2), pp. 205-211.

- Comay, Y. "The Migration of Professionals: An Empirical Analysis," Canadian Journal of Economics, August 1972, Vol. 5(3), pp. 419-429.
- DaVanzo, J. A. "Differences Between Return and Nonreturn Migration: An Econometric Analysis," International Migration Review, Spring 1976, Vol. 10(1), pp. 13-27.
- D'Amigo, R. J. "Earnings Attainment and Job Hierarchies in Monopoly and Competitional Capital Sectors," Ph.D. dissertation, Baltimore, John Hopkins University, 1978.
- Doeringer, P. B. "Determinants of the Structure of Industrial Type Internal Labor Markets," Industrial Labor Relations Review, January 1967, Vol. 20(2), pp. 206-220.
- Doeringer, P. B. "Unemployment and the Dual Labor Market," Public Interest, Winter 1975, Vol. 38 pp. 67-79.
- Doeringer, P. B. and M. J. Piore. Internal Labor Markets and Manpower Analysis. Lexington, Mass.: Heath, 1971.
- Edwards, R. C., M. Reich and D. M. Gordon, eds. Labor Market Segmentation. Lexington, Mass.: D. C. Heath and Co., 1975.
- Elderidge, H. T. "Primary, Secondary and Return Migration in the United States, 1955-60," Demography, 1965, Vol. 2, pp. 444-455.
- Fabricant, R. A. "An Expectational Model of Migration," Journal of Regional Science, April 1970, Vol. 10(1), pp. 13-24.
- Fields, G. S. "Labor Force Migration, Unemployment and Job Turnover," Review of Economics and Statistics, November 1976, Vol. 58, pp. 407-415.
- Folger, J. K. and C. B. Nam. "Education of the American Population," a 1960 Census Monograph. Prepared in cooperation with the Social Science Research Council. Washington, D.C. United States Government Printing Office, 1967.
- Freedman, M. Labor Markets: Segments and Shelters. Montclair, New Jersey: Allanheld Osnum & Co., Universe Books, 1976.
- Freiman, M. P. "Empirical Tests of Dual Labor Market Theory and Hedonic Measures of Occupational Attainment," Ph.D. dissertation, Madison, University of Wisconsin (Madison), 1976.
- Gallaway, L. E., R. F. Gilbert and P. E. Smith. "The Economics of Labor Mobility: An Empirical Analysis," Western Economic Journal, June 1967, Vol. 5(3), pp. 211-23.

- Gallaway, L. E. "Industry Variations in Geographic Labor Mobility Patterns," Journal of Human Resources, Fall 1967, Vol. 2(4), pp. 461-74.
- Gallaway, L. E. "Age and Labor Mobility Patterns," Southern Economic Journal, October 1969, Vol. 36(2), pp. 171-80.
- Gintis, H. "Education, Technology, and the Characteristics of Worker Productivity," American Economic Review, May 1971, Vol. 61(2), pp. 266-279.
- Gordon, D. M. Theories of Poverty and Underdevelopment: Orthodox, Radical and Dual Labor Market Perspectives. Lexington, Mass.: Heath & Co. 1972.
- Greenwood, M. J. "An Analysis of the Determinants of Geographic Labor Mobility in the United States," Review of Economics and Statistics, May 1969, Vol. 51(2), pp. 189-194.
- Greenwood, M. J. "The Geographic Mobility of College Graduates," Journal of Human Resources, Fall 1973, Vol. 8(4), pp. 506-515.
- Greenwood, M. J. "Research on Internal Migration in the United States: A Survey," Journal of Economic Literature, June 1975, Vol. 13(2), pp. 397-433.
- Hall, R. C. "Why is the Unemployment Rate so High at Full Employment?" Brookings Papers on Economic Activity, 1970 (3), pp. 369-410.
- Hall, R. C. "Turnover in the Labor Force," Brookings Papers on Economic Activity, 1972 (3), pp. 709-56.
- Harrison, B. "Additional Thoughts on the Dual Labor Market," Monthly Labor Review, April 1972, Vol. 95(4), pp. 37-9.
- Harrison, B. Education, Training and the Urban Ghetto Baltimore: Johns Hopkins University Press, 1972.
- Harrison, B. and A. Sum. "The Theory of Dual or Segmented Labor Markets," Journal of Economic Issues, September 1979, Vol. 13(3), pp. 687-706.
- Hicks, J. R. The Theory of Wages. New York: Macmillan, 1932.
- Jencks, C., et al. Inequality. New York: Basic Books, 1972.
- Kahn, L. M. "Internal Labor Markets: San Francisco Longshoremen," Industrial Relations, October 1976, Vol. 15(3), pp. 333-37.

- Katz, F. E. "Occupational Contact Networks," Social Forces, October 1958, Vol. 37, pp. 52-55.
- Kau, J. R. and C. F. Sirmans. "The Influence of Information Costs and Uncertainty on Migration: A Comparison of Migrant Types," Journal of Regional Science, April 1977, Vol. 17(1), pp. 89-96.
- Kerr, C. "The Balkanization of Labor Markets," in Labor Mobility and Economic Opportunity. Edited by E. W. Bakke, et al. New York: Wiley, 1954, pp. 92-110.
- Kmenta, J. Elements of Econometrics. New York: MacMillan Publishing Co., 1971.
- Kruse, W. J. "An Empirical Study of Labor Market Segmentation: Comment," Industrial and Labor Relations Review, January 1977, Vol. 30, pp. 218-20.
- Kuhn, T. The Structure of Scientific Revolution. Chicago: University of Chicago Press, 1970.
- Ladinsky, J. "The Geographic Mobility of Professional and Technical Manpower," Journal of Human Resources, Fall 1967, Vol. 2, pp. 475-94.
- Langley, P. C. "An Empirical Study of Labor Market Segmentation - Comment," Industrial and Labor Relations Review, December 1979, Vol. 69(5), pp. 775-86.
- Lansing, J. B. and E. Mueller. The Geographic Mobility of Labor. Ann Arbor: University of Michigan, 1967.
- Leigh, D. E. "Male Occupational Mobility Between 1965 and 1970: Evidence From the 1970 Census." Madison: The Institute, University of Wisconsin, Discussion Paper 284-35, 1975.
- Leigh, D. E. "Occupational Advancement in the Late 1960's: An Indirect Test of the Dual Labor Market Hypothesis," Journal of Human Resources, Spring 1976, Vol. 11(2), pp. 155-71.
- Long, L. H. "Migration Differentials by Education and Occupation: Trends and Variations," Demography, May 1973, Vol. 10(2), pp. 243-58.
- Loveridge, R. and A. Mok. "Theoretical Approaches to Segmented Labour Markets," International Journal of Social Economics, Vol. 7, 1980, pp. 376-411.
- Lowell, R. F. "Testing a Dual Labor Market Classification of Jobs," Journal of Regional Science, April 1978, Vol. 18(1), pp. 95-104.

- Lowery, I. S. Migration and Metropolitan Growth: Two Analytical Models. San Francisco: Candler Publishing Co., 1966.
- Lucas, R. "Working Conditions, Wage-Rates and Human Capital: A Hedonic Study," Ph.D. dissertation, Cambridge, Mass. Institute of Technology, 1972.
- Mayhew, K. and B. Roswell. "Labor Market Segmentation in Britain," Oxford Bulletin of Economic Statistics, May 1979, Vol. 4(2), pp. 81-115.
- Mill, J. S. Principles of Political Economy. New York: The Colonial Press, Vol. I Revised Edition 1848.
- Miller, A. R. "Migration Differentials Among Occupation Groups: United States 1960," WPC/WP/1979, Belgrade, United Nations World Population Conference.
- Miller, E. M. "Is Outmigration Affected by Economic Conditions?" Southern Economic Journal, January 1973, Vol. 39(3), pp. 396-405.
- Mincer, J. "The Distribution of Labor Incomes: A Survey," Journal of Economic Literature, March 1970, Vol. 8(1), pp. 1-26.
- Mincer, J. Schooling Experience, and Earnings. New York, New York: National Bureau of Economic Research, 1974.
- Morgan, C. "Is Out-Migration Affected by Economic Conditions?" Southern Economic Journal, April 1976, Vol. 42(4), pp. 752-758.
- Morley, S. A., et al. "Evidence on the Internal Labor Market During a Process of Rapid Economic Growth," Journal of Development Economics, June 1979, Vol. 6(2), pp. 261-86.
- Muth, R. F. "Migration: Chicken or Egg," Southern Economic Journal, January 1971, Vol. pp. 295-306.
- Myers, G. C. "Migration and the Labor Force," Monthly Labor Review, September 1974, Vol. 97(9), pp. 12-16.
- Narratil, F. T. and J. T. Doyle. "The Socioeconomic Determinants of Migration and the Level of Aggregation," Southern Economic Journal, April 1977, Vol. 43(4), pp. 1547-1559.
- Nghiep, N. H. "Earnings Expectations and the Role of Human Capital in the Migration Decision: An Empirical Analysis," Ph.D. dissertation, Knoxville, Tennessee, The University of Tennessee, 1981.

- Nelson, P. "Migration, Real Income and Information," Journal of Regional Science, Spring 1959, Vol. 1(2), pp. 43-74.
- O'Boyle, E. J. "Job Tenure: How it Relates to Race and Age," Monthly Labor Review, September 1969, Vol. 92(9), pp. 16-24.
- Oi, W. Y. "Labor as a Quasi-Fixed Factor," Journal of Political Economy, December 1962, Vol. 70(6), pp. 538-55.
- Okun, A. M. "Upward Mobility in a High Pressure Economy," Brookings Papers on Economic Activity, 1973, Vol. 1, pp. 207-61.
- Olsen, R. J., et al. MULTIREGION a Simulation - Forecasting Model of BEA Economic Area Population and Employment. Oak Ridge, TN 1977.
- Olvey, L. D. "Regional Growth and Inter-Regional Migration--Their Pattern of Interaction," Review of Regional Studies, Winter 1972, pp. 139-163.
- Oster, G. "A Factor Analytic Test of the Theory of the Dual Economy," Review of Economics and Statistics, February 1979, Vol. 61, pp. 33-39.
- Osterman, P. "An Empirical Study of Labor Market Segmentation," Industrial and Labor Relations Review, July 1975, Vol. 28(4), pp. 508-23.
- Osterman, P. "An Empirical Study of Labor Market Segmentation--Reply," Industrial and Labor Relations Review, January 1977, Vol. 30, pp. 221-24.
- Parsons, D. O. "Specific Human Capital: An Application to Quit Rates and Layoff Rates," Journal of Political Economy, November-December 1972, Vol. 8(6), pp. 1120-43.
- Perry, G. L. "Unemployment Flows in the U.S. Labor Market," Brookings Papers on Economic Activity, 1972, Vol. 2, pp. 93-104.
- Persky, J. J. and J. F. Hain. "Migration, Employment and Race in the Deep South," Southern Economic Journal, January 1970, Vol. 36(3), pp. 268-276.
- Pihlblad, C. T. and C. L. Gregory. "Occupation and Patterns of Migration," Social Forces, October 1957, Vol. 36(1), pp. 56-64.
- Pindyck, R. S. and D. L. Rubinfeld. Econometric Models and Econometric Forecasts. Second Edition, New York: McGraw-Hill, 1981.

- Piore, M. J. "On-The-Job Training in the Dual Labor Market," in Public-Private Manpower Policies. Edited by A. R. Weber, F. Cassell and W. L. Ginsberg. Madison: Industrial Relations Research Association, University of Wisconsin, 1969, pp. 101-32.
- Piore, M. J. "The Dual Labor Market: Theory and Implications," in Problems in Political Economy: An Urban Prospective, ed. D. M. Gordon, Lexington, Mass: Heath, 1971.
- Piore, M. J. "Fragments of a 'Sociological' Theory of Wages," American Economic Review, May 1973, Vol. 63(2), pp. 377-84.
- Piore, M. J. "Primary and Secondary Labor Markets: A Critique of the Dual Approach--Comment," Brookings Papers on Economic Activities, 1974 Vol. (3), pp. 684-88.
- Piore, M. J. "Notes for a Theory of Labor Market Stratification," in Labor Market Segmentation, ed. R. C. Edwards, M. Reich, D. M. Gordon, Lexington, Mass.: Heath, 1975.
- Piore, M. J., D. Gordon and R. Edwards. "A Theory of Labor Market Segmentation," American Economic Review, May 1977, Vol. 63, pp. 359-65.
- Rees, A. "Information Networks in Labour Markets," American Economic Review, May 1966, pp. 559-566.
- Reich, M. R. "The Economics of Racism" in Problems in Political Economy: An Urban Perspective edited by D. M. Gordon, Lexington, Mass.: Heath, 1971, pp. 107-113.
- Reich, M. R. and D. M. Gordon and R. C. Edwards. "Dual Labor Markets: As Theory of Labor Market Segmentation," American Economic Review, 1973 Vol. 63(2), pp. 359-365.
- Reich, M. "A Theory of Labor Market Segmentation," American Economic Review, May 1973, 63(2), pp. 359-65.
- Rocha, J. R. "The Differential Impact of an Urban Labor Market Upon the Mobility of White and Negro Potentially Skilled Workers," Ph.D. Dissertation, University of Iowa, 1966.
- Rogers, A. "A Regression Analysis of Interregional Migration in California," Review of Economics and Statistics, May 1967, pp. 262-267.
- Romans, J. T. "Benefits and Burdens of Migration (with Specific Reference to the Brain Drain)," Southern Economic Journal, January 1974, pp. 447-455.

- Rose, A. M. "Distance of Migration and Socioeconomic Status of Migrants," American Sociological Review, 1958 (23), pp. 420-423.
- Rosen, S. "Human Capital: A Survey of Empirical Research," Discussion Paper 76-2, Department of Economics, University of Rochester, Revised, Jan. 1976.
- Rosenberg, S. "The Dual Labor Market: Its Existence and Consequence," Ph.D. dissertation, University of California, Berkley, 1975.
- Ross, A. M. "Do We Have a New Industrial Feudalism?" American Economic Review, December 1958, Vol. 48(5), pp. 903-20.
- Rumberger, R. W. and M. Carnoy. "Segmentation in the U.S. Labour Market: Its Effects on the Mobility and Earnings of Whites and Blacks," Cambridge Journal of Economics 4, 1980 pp. 117-132.
- Saben, S. "Geographic Mobility and Employment Status," Monthly Labor Review, August 1964, Vol. 87(8), pp. 873-81.
- Schiller, B. R. "Relative Earnings Mobility in the United States," American Economic Review, December 1977, Vol. (67), pp. 926-40.
- Schlottmann, A. M. and H. W. Herzog. "Employment Status and the Decision to Migrate," Review of Economics and Statistics, November 1981, Vol. LXII(4), pp. 590-598.
- Schlottmann, A. M. and H. W. Herzog. "Home Conditions and the Decision to Migrate: New Evidence for the U.S. Labor Force," Southern Economic Journal, April 1982.
- Schroeder, L. D. "Interrelatedness of Occupational and Geographic Labor Mobility," Industrial and Labor Relations Review, pp. 405-411.
- Schultz, T. W. "Investment in Human Capital," American Economic Review, March 1961, Vol. 51(1), pp. 1-7.
- Schwartz, A. "Interpreting the Effect of Distance on Migration," Journal of Political Economy, September-October 1973, Vol. 81(5), pp. 1153-1169.
- Schwartz, A. "Migration, Age and Education," Journal of Political Economy, August 1976, pp. 701-719.
- Shryock, H. S. and E. A. Larmon. "Some Longitudinal Data on Internal Migration," Demography, 1965 (2), pp. 579-93.
- Smith, A. The Wealth of Nations, London: Methven, 1904.

- Sjaastad, L. A. "The Costs and Returns of Human Migration," Journal of Political Economy, Supplement, October 1962, Vol. 70(5), pp. 80-93.
- Sommers, D. and A. Eck. "Occupational Mobility in the American Labor Force," Monthly Labor Review, January 1977, Vol. 100(1), pp. 3-19.
- Sommers, P. M. and H. Suits, "Analysis of Net Interstate Migration," Southern Economic Journal, October 1973, pp. 193-201.
- Sonnefield, J. E. "Community Perceptions and Migration Intentions," Proceedings of the Association of American Geography, 1974 (6), pp. 13-17.
- Stanberg, E. "Upward Mobility in the Internal Labor Market," Industrial Relations, May 1975, pp. 259-65.
- Suval, F. M. and C. H. Hamilton. "Some New Evidence on Educational Selectivity in Migration to and from the South." Social Forces. May 1965, pp. 536-547.
- Tarver, J. D. "Occupational Migration Differentials," Social Forces, December 1964, Vol. 43(2), pp. 231-41.
- Thurow, L. C. Generating Inequality: Mechanisms of Distribution in the U.S. Economy, New York: Basic Books, 1975.
- Thurow, L. C. and Robert E. B. Lucas. The American Distribution of Income: A Structural Problem. U.S. Joint Economic Committee. Washington, D.C.: U.S. Government Printing Office, 1972.
- Vanderkamp, J. "Interregional Mobility in Canada: A Study of the Time Pattern of Migration," Canadian Journal of Economics, August 1968, pp. 595-608.
- Vietorisz, T. and B. Harrison. "Labor Market Segmentation: Positive Feedback and Divergent Development," American Economic Review, May 1973, Vol. 63(2), pp. 366-76.
- Wachtel, H. M. "Class Consciousness and Stratification in the Labor Process," in Labor Market Segmentation, eds. Edwards, Reich, and Gordon, Lexington, Mass.: Heath, 1975, pp. 95-124.
- Wachter, M. L. "A Labor Supply Model for Secondary Workers," Review of Economics and Statistics, May 1972, Vol. 54, pp. 141-51.

- Wachter, M. L. "The Primary and Secondary Labor Market Mechanism: A Critique of the Dual Approach," Brookings Papers on Economic Activities, 1974, (3), pp. 637-80.
- Wadychi, W. J. "Alternative Opportunities and Interstate Migration: Some Additional Results," Review of Economics and Statistics, May 1974, pp. 254-257.
- Willis, K. G. "Geographical and Labour Mobility," Papers on Migration and Mobility no. 11, Department of Geography, University of Newcastle upon Tyne 1972.

APPENDIX

FIGURE A-1
BEA AREA'S

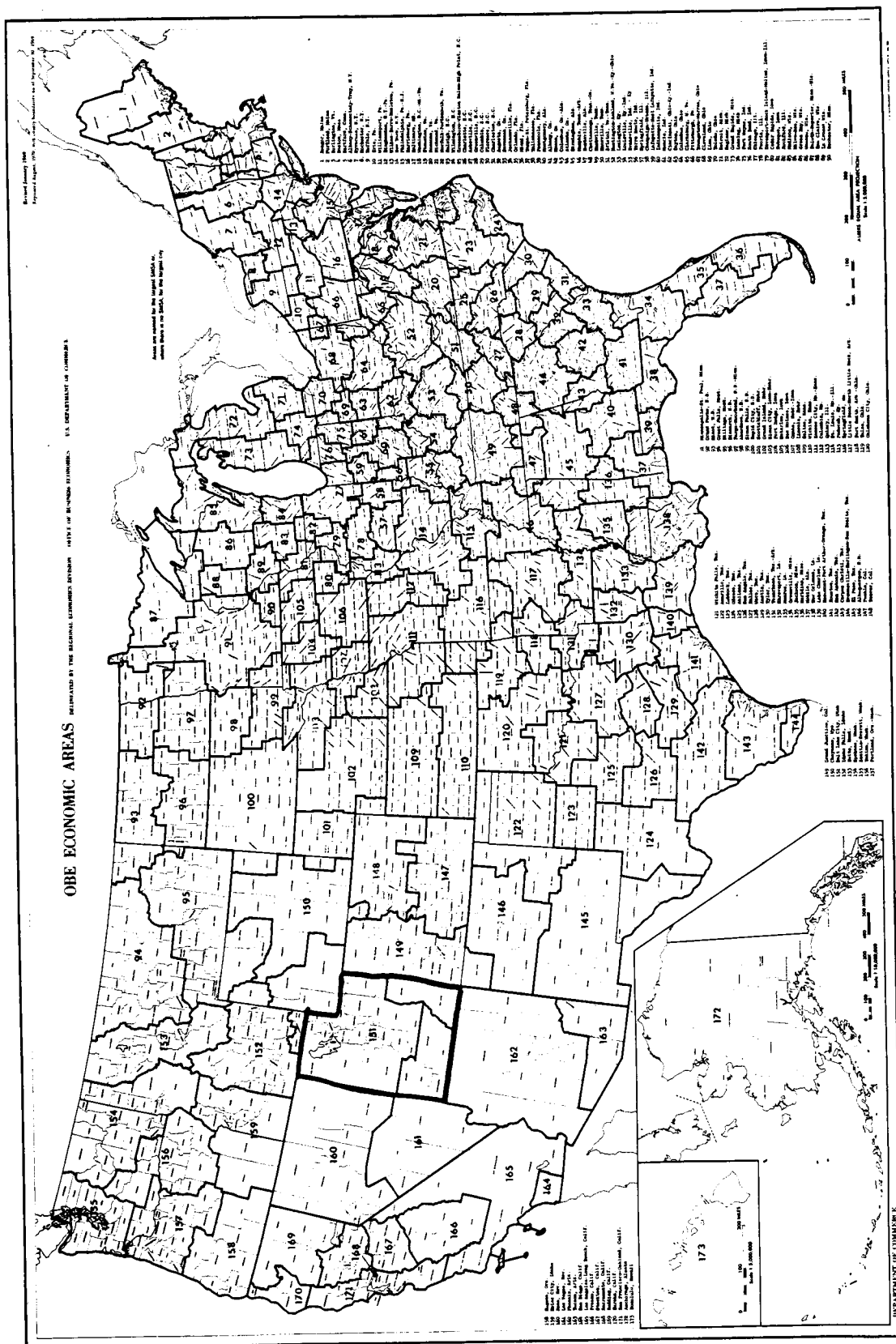


TABLE A-1
BREAKDOWN OF INDUSTRIES INTO
CORE AND PERIPHERY

Core	Periphery
Communication	Agriculture, Forestry and Fishing
Construction	Amusement, Recreation and Related Services
Educational Services	Manufacturing--Food and Kindred Products
Finance, Insurance and Real Estate	Manufacturing--Textile Products
Government--Public Service	Manufacturing--Tobacco
Manufacturing--Chemical and Allied Products	Manufacturing--Other Durables
Manufacturing--Machinery	Manufacturing--Other Non-Durables
Manufacturing--Metal Industries	Personal Services
Manufacturing--Motor Vehicles	Repair Services
Manufacturing--Paper and Allied Products	Retail Trade
Medical and Dental Health Services	
Mining and Extraction Other Public Utilities, Printing, Publishing and Related Services	
Professional and Related Services	
Transportation	
Wholesale Trade	

TABLE A-2

DIVISION OF SAMPLE INTO TIERS
AS SUGGESTED BY OSTERMAN

Tier One		Tier Two		Tier Three	
(a)	Physicians and Dentists	(a)	Craftsmen and Kindred Workers	(a)	Retail Store Salesmen, News-boys, Peddlers, etc.
(b)	Other Medical and Paramedical-Chiropractors, nurses, etc.	(b)	Government Protective Service Workers--Firemen, Police, Constables	(b)	Unskilled Laborers-Nonfarm
(c)	Accountants and Auditors	(c)	Secretaries, Stenographers	(c)	Farm Laborers
(d)	Teachers--Primary and Secondary	(d)	Other Clerical Workers; Bank Tellers, Cashiers, Receptionists', etc.	(d)	Private Household Workers
(e)	Teachers--College	(e)	Foremen	(e)	Other Service Workers--Barbers, Bartenders, Counter and Fountain Workers,
(f)	Social Scientists and Biological Scientists	(f)	Transport Equipment Operatives		
(g)	Architects; Chemists; Engineers; Physical Scientists	(g)	Operatives Except Transport		
(h)	Technicians; Airline Pilots; Draftsmen; Foresters; Designers; Photographers; Conservationists; Radio Operators; Surveyors	(h)	Farmers and Farm Managers		
(i)	Public Advisors--Clergymen; Editors and Reporters; Farm and Home Management Advisors; Personnel and Labor Relations Workers; Publicity Workers; Religious, Social and Welfare Workers				
(j)	Judges; Lawyers				
(k)	Managers, Officials and Proprietors Not Self-Employed				
(l)	Professional, Technical and Kindred Workers Not Listed Above				

VITA

Ernest Preston Goss was born in Emerson, Georgia in January 1946. He attended elementary school in that city and graduated from Cass High School in 1964. He was drafted into the military services in 1964. Upon discharge from the military service in 1968, he entered the University of South Florida in Tampa, Florida. In 1972, he graduated from that school with a major in accounting.

After working for one year as an accountant with Allstate Leasing and Acceptance Corporation, he entered graduate school at Georgia State University in Atlanta. He received his Master of Business Administration degree with major in quantitative methods from that school in 1975.

After teaching for two years at Motlow College, he entered the doctoral program in economics at The University of Tennessee in Knoxville. While at The University of Tennessee, he served as a graduate teaching assistant in the economics department for one year, as a graduate research assistant at the Center for Business and Economic Research at The University of Tennessee for two years and as a graduate research assistant at the Oak Ridge National Laboratories for one year.

After teaching for two years at Maryville College, the author accepted a position at the Center for Management and Economic Research at the University of Alabama, Huntsville. He received his doctoral degree in December 1983 while employed at the University of Alabama, Huntsville.