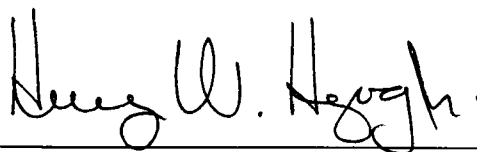


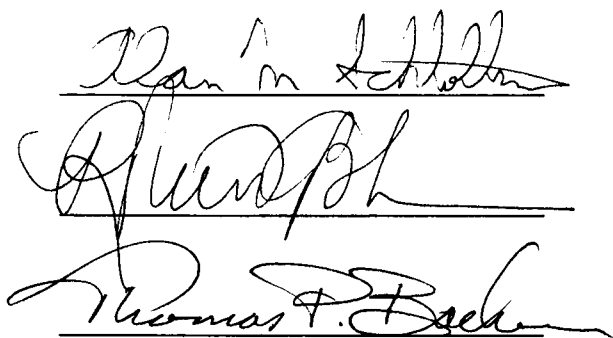
To the Graduate Council:

I am submitting herewith a dissertation written by John Adam Hill entitled "Job-Search and Displaced Workers: A Methodology Using Labor Market Outcomes To Assess Regional Structural Conditions Over Time." 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.



Dr. Henry W. Herzog, Jr., Major Professor

We have read this dissertation
and recommend its acceptance:



Accepted for the Council


Associate Vice Chancellor
and Dean of The Graduate School

**JOB SEARCH AND DISPLACED WORKERS:
A METHODOLOGY USING LABOR MARKET OUTCOMES
TO ASSESS REGIONAL STRUCTURAL CONDITIONS OVER TIME**

**A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville**

**John Adam Hill
December 1995**

DEDICATION

This dissertation is dedicated to my mother, Pauline Cason Hill, who has supported me in all my academic aims.

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ABSTRACT

This research developed a methodology for assessing regional structural changes across time based on the labor market outcomes of displaced workers. This inquiry defined displaced workers to be those workers who have lost their jobs because of plant closure, shift elimination, and slack work. The design of this study is not to provide an explanation for these aforementioned causes of displacement. Instead, the investigation of changing regional structure requires that correlation between worker displacement and regional structural change be established. Establishing this connection is crucial, because it is the goal of this investigation to gain insight regarding changing regional structure from the labor market outcomes of displaced workers.

The aforementioned definition of displaced workers is the same definition employed by the Displaced Workers Supplement (DWS) to the Current Population Survey (CPS). The data on displaced workers were taken from the DWS, which contains variables that describe the characteristics of the displaced worker, the characteristics of the displaced worker's job, the characteristics of search, and the timing of displacement.

The DWS data was used to calculate reemployment rates and estimate a series of job-search equations for displaced workers. The estimates were used to decompose the differences in reemployment rates into components that are representative of (1) changes in reemployment linked to changing worker endowments and (2) changes in the reemployment rate linked to changing employer's perceptions about worker endowments or structure.

It was concluded that this methodology provided useful insights about regional structural change, as manifested in the changing reemployment rates of displaced workers over time. Using the results of this study, public policy regarding education and worker retraining, information disclosure by firms, and job matching can be designed at the regional level to better aid those workers who lose their job as a result of structural change.

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CHAPTER 1

INTRODUCTION AND STATEMENT OF THE PROBLEM

Interest in and studies on displaced workers began during the automation scare in the late 1950's and early 1960's which, in turn, led to concerns regarding the intractability of unemployment (Seitchik, 1991, 55). Interest continued into the coming decades as displacement became a more pervasive problem. In the industrial heartland of the Midwest, trends in automation and outsourcing continued to claim jobs, but a good share of worker dislocation was a result of plant closings and disinvestment. Even with the national recovery initiating in 1983 and national job growth in excess of 10% in the 1980's, the industrial core states had fewer jobs in 1986 than 1979 (Markusen and Carlson, 1989, 29). Meanwhile, other regions experienced displacement to a lesser degree. Unlike the Midwest, the South grew faster than any other region in terms of its employment rolls between the years 1960 and 1985. Additionally, more people migrated to the South than to any other region in the country between 1965 and 1980. These migration and employment trends continued throughout the 1980's (Glickman and Glasmeier, 1989, 65-6).

However, this is not to assume that a growing regional economy is immune from worker displacement. Growing regions, such as the South, continued to lose manufacturing jobs in recent years as did the industrialized Midwest. The employment and displacement results are mixed for growth regions such as the South, since the decline

in investment and the increase in unemployment arising from manufacturing-linked displacement can be offset by the growth in other sectors. In contrast, the results of displacement in the low-growth areas are much more severe and can be economically and socially disastrous. These scenarios indicate that if one is to understand displacement, it is appropriate to consider worker displacement in a regional rather than a nation context (Rodwin, 1989, 17).

The divergent rates of displacement that manifest themselves in different regions can be linked to unique regional events and performance (Seitchik, 1991, 53). The catalyst for such displacements in the most recent years may be found in changes that are structural in nature. Evidence for this assertion is seen in manufacturing employment figures. Since the 1970's, manufacturing employment has diverged from overall national growth. Economists argue that this bifurcation has arisen because of identifiable structural changes of the past decade that are unrelated to the business cycle. To explain the deindustrialization during this decade, they point to a corporate profit squeeze, greater outsourcing, offshore production by American multinationals, a financial explosion heavily favored by monetary, tax, and deregulation policies, and a changing international economic environment (Markusen and Carlson, 1989, 35).

Another trend, known as the post-industrial thesis, is offered as explanation for worker displacement particular to the manufacturing sector. The post-industrial thesis proposes that in a more advanced economy, one may expect an increased level of technical and service activities and a decline in the sectoral share of manufacturing. This condition arises as manufacturing productivity declines relative to service productivity.

Additionally, advanced economies have a greater income elasticity of demand for services in comparison with that manufacturing (Rodwin, 1989, 13). This assertion has been demonstrated in the manufacturing sector of the United States. For example, one study charted the progress of 92 manufacturing industries in the United States and discovered that 57 of these industries underwent structural alteration in level or rate of growth of employment after 1968. Of these sampled industries, 25 ceased to create jobs in later years independent of the business cycle or favorable movements in terms of foreign trade. Lastly, this study notes that one-third of all manufacturing jobs were in sectors that would decrease or cease long-run job creation in the 1970's (Bluestone, Harrison, and Clayton-Matthews, 1986).

In either case, it would seem that there is evidence to support the assertion that displacement arises from structural changes. Abscribing to the post-industrial thesis, one would assume that these structural changes occurred in a uniform fashion as the nation proceeded to a more advanced economic state. Also, one could recognize random regional structural changes as the result of a dynamic economy where one must have growth in some regions relative to decline experienced in others. These dynamic regional differences can be traced to changes in technology and infrastructure, shifts in spending patterns, changes in levels of income and markets, and movements of population and of economic activity (Rodwin, 1989, 13). This purpose of this investigation is not to promote either of these approaches as dominant; rather, it offers a methodology to assess the change in structure over time that both approaches acknowledge.

Additionally, the design of this study is not to provide an explanation for these aforementioned causes of displacement. Instead, these structural issues are introduced because this analysis requires that correlation between worker displacement and regional structural change be established for the proposed investigation. Establishing this connection is crucial, because it is the goal of this investigation to gain insight regarding regional structural differences from the labor market outcomes of displaced workers. This connection has been pioneered by authors Henry Herzog and Alan Schlottmann (1995), where they employ Current Population Survey (CPS) data on reemployment likelihood as summarized in the Displaced Worker Supplement (DWS) to analyze structural differences between regions¹. They then use their results to rank regional structure as revealed in the reemployment opportunities available to displaced workers. The DWS to the CPS is ideal for assessing the reemployment likelihood of displaced workers. The CPS identifies displaced workers as a special class of the unemployed who have lost their job involuntarily based on the operating decision of a firm, plant, or business in which the displaced worker was employed. For the purpose of identification, these decisions that created the condition of displacement are limited to plant closure, shift elimination, or slack work (Howland, 1988, 116). Furthermore, displaced workers are those individuals with established work histories who have lost their jobs through no fault of their own and who are likely to encounter considerable difficulty finding comparable employment (Seitchik, 1991, 52). Also, it is important to clarify what is meant by the term "structure" as employed in this investigation. In this analysis, national or regional structure is

¹ Herzog and Schlottmann (1994) methodology employs data provided in the Displaced Workers Supplement (DWS) to the Current Population Survey. These data were collected in January of 1992.

concerned with the technical structure of the nation and regions during a particular period. The demands on national or regional labor markets by employers are a manifestation of this technical structure. As technological structure changes over time, so do the employer perceptions and their demands placed on skills and attributes of workers in national and regional labor markets (Carter, 1970, 9-11). Therefore, when temporal differences in technical structure are discussed, these changes are denominated in terms of displacement and reemployment as they arise from changing employer perceptions.

The Herzog and Schlottmann analysis investigates these structural differences for a single period. However, to capture regional structural differences as they change in a dynamic regional economy, one should add the element of time to the study. By investigating labor market outcomes across time for displaced workers, this investigation will be able to chart structural differences for single regions as they change temporally. This should be of benefit for three reasons. First, the estimated results yielded by this analysis will consist of the regional search outcomes for displaced workers as catalogued by five consecutive DWS assessments. Most job-search investigations employ only one set of estimations; this study is unique in that estimations are provided at both the national and regional level for five periods of assessment. Second, the existing methodologies for evaluating structural change are limited. Such measures of structural change include regional accounting measures, such as Gross Regional Product (GRP), calculations that utilize the divergence between national and regional employment figures to discuss regional structural gains or losses, as exemplified by shift-share analysis, or regional trade patterns between sectors as summarized in regional input-output analysis. The advantage

of the methodology established in this investigation is that it offers another means of charting structural change which is directly linked to the casualties of regional restructuring over time. Lastly, the results of the decomposition developed in this analysis can be used in the development of regional policy to aid displaced workers. Using the results of the estimated job-search equations and the decomposition, policy makers can design distinct regional aid programs to assist displaced workers, basing their recommendations on these results obtained at both the national and regional levels. Also, application of the regional upswings and downturns delineated by this study can be used as a standard for deeming past regional policy wise or inappropriate².

This study begins with three literature reviews: an outline of job-search theory, an overview of empirical investigations regarding job-search, and a brief description of alternative means of assessing regional structural change. Using the insights gained from these aforementioned sources, binomial multivariate logit models are estimated econometrically for different regions and time periods. First, these estimations are used to establish regional rankings for each year included in this investigation³. Then these estimated results will be used to chart temporal structural differences in specific regions as revealed by reemployment opportunities, allowing one to follow the structural change of a particular region over an eight-year span.

² This might be a more realistic application of the decomposition methodology. The data used in this study are collected in January of each even numbered year (excepting the 1994 DWS) and the results are made available, ideally, at the end of the year. As regional conditions would have changed considerably during that 10-12 month lag, it is more reasonable to use this as a descriptive methodology.

³ Again, the Herzog and Schlottmann (1994) analysis used the 1992 CPS-DWS for its estimations. This study will add to their results by expanding its application to CPS-DWS collected in 1986, 1988, 1990, and 1994.

CHAPTER 2

REVIEW OF THE LITERATURE

The primary purpose of this analysis is to assess the temporal structural differences as manifested in the reemployment outcomes of displaced workers at the national level or in a specific region. To accomplish this, estimates of the relationship between reemployment likelihood and worker characteristics were conducted. These estimates revealed the correlation between the displaced workers reemployment opportunities and the attributes unique to the worker, the job from which they were displaced, their search for reemployment, and the timing of their displacement. This is a preliminary step required to assess both regional and temporal structural differences.

This analysis begins with a general overview of traditional job-search theory, and explains the reemployment process of the displaced worker within this theoretical construct. Next, an overview of empirical job-search analyses is composed to justify the displacement and worker attributes used in the estimation of subsequent models for this study. Lastly, existing techniques for assessing regional structural change are briefly explained, highlighting the methodological weaknesses of each procedure.

I. Job-search theory

All economic markets are characterized by a search process. Deterministic theories about the search process in economic markets are weakened when faced with justifying the divergence of prices in markets for identical bundles of attributes. To explain such differences in prices for like bundles of attributes, it is necessary to devise

models that employ optimal stopping rules for the buyers and sellers in such markets. Optimal stopping rules that govern searcher behavior are established by the searcher's perceived payoff from the search process and the expenses of participating in the search (Lippman and McCall, 1976, 155).

The search process in labor markets is hindered by the imperfect quality of information possessed by both the employer and employee. Potential employees have sketchy information about the opportunities that exist in the job market for which they are eligible; likewise, employers have incomplete information about the differing worker profiles available for hire in the job market (Ehrenberg, 1988, 611-12).

As a comprehensive search on the part of the employer would be too costly, a vector of minimally acceptable attributes are established to assist in the evaluation of potential employees. This vector, denoted by K , consists of educational requirements, work experience, performance on hiring tests, etc. For these attributes, the firm establishes a wage, W , commensurate with the minimum bundle of skills, such that:

$$W = W(K).$$

As each employer establishes a different K , there will be different wages in the labor market. Wages form a probability distribution of wage offers, $f(W)$, which represents all the available job offers in the market. Attribute bundles sought by these firms are generated randomly, hence the wages paid for attributes are established randomly, therefore $f(W)$ is of a normal distribution (Ehrenberg, 1988, 611-12).

For example, assume the existence an individual with the attribute vector K^* . As firms will only hire those workers that satisfy their preset minimum requirement of K , this individual knows that they will not be able to secure a wage where:

$$W > W^*(K^*)$$

In an ideal scenario, worker K^* would apply to employers needing a worker with, at minimum, K^* attributes. The worker would then be employed for a wage of W^* , assuming that the firm had a vacancy (Ehrenberg, 1988, 611-12).

Unfortunately, workers only have a general idea of the job opportunities for their skills and are unaware of particular firms hiring employees possessing their attributes. To restate: the worker knows the shape of the probability distribution $f(W)$, but does not know each firm's hiring standard. It is from this probability distribution of jobs that the worker searches for employment at some wage W^A or their acceptance wage. In their search process, it is assumed that they are risk neutral and that they are governed by Bellman's principle of dynamic optimality (Lippman and McCall, 1976, 158). According to dynamic optimality, the present decision in a sequence of decisions maximizes current net returns plus the expected future stream of discounted returns. This result is reached because decisions about the future are made optimally when based on current or conditional expectations (Mortensen, 1986, 856).

Workers vary the intensity of their search process based on their desire to maximize these net benefits coupled with their general understanding of the wage probability distribution. Some workers realize the unique value of their skills in the labor market and will reject all offers that fall short of their expectations and continue the job-

search. Likewise, low-skill workers may take any offer received, realizing that the cost of increased search will only outweigh the minimal returns to search, given their low level of skill. In both these cases, the notion is that workers establish a decision rule in the form of a wage that is applied to all job offers. This decision rule, known as a reservation wage, W^R , is unique to each worker and is based on

1. their perception of the return to searching for a job in the form of a wage befitting their skills and
2. their perception of the search costs involved in finding a job that will pay a suitable wage (Lippman and McCall, 1976, 158).

Therefore, a worker will

commit to a job if $W^R \leq W^A$ or will,

continue to search if $W^R > W^A$.

Too, it can be expected that no wage offers will exceed W^* as this wage is determined by the worker's skill level and no firm will hire a worker at a rate exceeding their skills.

Therefore, acceptable wage offers occupy a probability distribution band bounded by a minimum wage of W^R and a maximum wage of W^* . The expected or average wage, $E(W)$, for a worker is then the weighted average of the job offers in the W^R to W^* range. If W^R is increased by the worker, $E(W)$ will increase, while the probability of finding an acceptable job would decrease, thereby increasing the duration of joblessness (Ehrenberg, p. 613).

Several implications follow from these constructs of the job-search model. The presence of imperfect information is significant in the development of these outcomes, as it adds an element of realism to the job-search model. These conclusions are as follow:

1. When W^R exceeds the minimum wage offered in the labor market, the probability of finding a job is less than one and there will exist search unemployment.
2. As $W^R < W^*$, $W^* = W^*(K^*)$ is assumed always true, individuals may be underemployed as the accepted wage will not offer full compensation for their skills.
3. For two individuals, "i" and "j", it may be that $K_i = K_j$, however W_i^A may or may not equal W_j^A . While these two individuals have the same W^R , thus identical $E(W)$, W^A for both workers depends purely on chance due to imperfect information.
4. Anything that mitigates the cost of unemployment will result in an increase in the reservation wage. This will cause a rise in the duration of unemployment and a increase in the W^A post-unemployment.
5. If the individual's discount rate is increased, current income becomes more valuable than future income to the worker. Such an individual would lower their reservation wage, thereby decreasing the duration of their unemployment and increasing their post-employment W^A .
6. The shorter the length of time that an individual expects to be employed, the smaller the payoff to job-search activities. The worker will minimize

search cost by selecting a lower W^R that ensures job-search with faster results.

7. Increases in K^* will result in an increase in W^R and an increase in W^* .

An increase in W^R will cause $E(W)$ to rise and the duration of joblessness to fall while the increase in W^* will likewise cause $E(W)$ to fall, but the duration of joblessness to decrease. The outcome is that an increase in the level of skill will cause $E(W)$ to increase, but will have an ambiguous impact on jobless duration (Ehrenberg, 1988, 614).

The approach presented here is a simplistic model of job-search theory. While there exists more rigorous analyses of job-search theory, this simple model provides the essence of job-search literature assertions which are relevant to understanding issues pertaining to the joblessness of the displaced worker. Empirical analysis of worker displacement artifacts, such as duration of joblessness, reemployment likelihood, and post-jobless wages, all depend on job-search theory as an economic basis.

II. Empirical job-search models of labor market outcomes for displaced workers

Empirical job-search analyses focus on the various attributes of the laborer who is searching for employment. These attributes and characteristics, the values of which can be justified within the context of job-search theory, are used to econometrically model labor market outcomes.

Attributes that affect labor market outcomes can be divided into four classes:¹ characteristics of the worker, characteristics of the displaced job, characteristics of search,

¹ These attribute classes are utilized throughout this investigation.

and timing of displacement. These four classes of attributes surface in empirical analyses conducted in previous displaced worker/job-search models. As the purpose of this analysis is to assess regional structural change over time, this investigation will only consider variables that have been previously tested in other empirical job-search models.

A. Characteristics of workers

The attributes of the displaced worker can simplify or complicate that worker's odds for reemployment. Relevant worker characteristics include age, education, marital status and job occupation. Each of the aforementioned attributes impact the displaced worker's odds of reemployment.

1. Age Between the years 1979 to 1983, it was discovered that younger workers had better odds of reemployment after displacement than did their older counterparts. The reemployed in 1984 ranged from a high of 72 percent for men age 20 to 24 to a low of 17 percent for those 65 years of age and over. Most of the men in the latter group had apparently retired after losing their jobs (Flaim and Sehgal, 1987, 216).

Age is a standard characteristic for inclusion in job-search models. Podgursky and Swaim (1987a and 1987b) conducted regional and industry investigations of worker displacement and discovered that older workers had larger post-displacement wage losses than younger workers. Swaim and Podgursky (1990) demonstrate that jobless duration increases (reemployment likelihood decreases) with age. Addison and Fox (1993) demonstrate that increased age slows the number of jobs taken following displacement.

2. Education Levels of formal education are also expected to affect a worker's post-displacement experience. Relatively better educated workers should achieve shorter

joblessness and increased reemployment likelihood versus their less educated counterparts (Howland, 1988, 121).

Education serves to augment reemployment opportunities across occupations. Education increases the reemployment likelihood of both blue-collar and white-collar workers, however the return to education for white-collar workers exceeds that of blue-collar workers (Howland and Peterson, 1988, 119).

3. Marriage Individual reemployment prospects are improved by marriage. When married, a household can offer more labor, thus bringing home an additional income. The outcome is that labor will then be willing to set a lower reservation wage and will thereby increase the chance of reemployment. Corroboration of this apriori expectation is demonstrated, but not limited to, studies by Herzog and Schlottmann (1994), Swaim and Podgursky (1990) and (1992), and Addison and Portugal (1989).

4. Occupation In general, the more skilled the occupation, the more likely is the displaced worker to be reemployed. This was revealed in a study that discovered that about 75 percent of those displaced from managerial and professional occupations were working when interviewed in 1984. In contrast, among the workers who had lost low-skill level jobs, less than one-half were working in January of 1984 (Flaim and Sehgal, 1984, 6).

One explanation is that the skills of the white-collar worker equip such workers to recover better after displacement. The skills of the white-collar worker are more general than blue-collar skills, and white-collar workers displaced from the manufacturing sector can thus take advantage of growth in other sectors of the local economy. This is further

seen in the attachment demonstrated by blue-collar workers to the industry from that they were displaced. Nearly 38% of rehired displaced blue-collar workers stayed in the same 2-digit industry, compared to 25% of white-collar workers. Additionally, white-collar workers were more likely than blue-collar workers to move within the trade and service industries (Howland and Peterson 1988, 117). This is not to say that all white-collar workers obtained reemployment with relative ease. White-collar managers had a relatively more difficult time securing reemployment than their white-collar, non-management counterparts. This could be linked to the presence internal labor markets² along with firm specific management practices (Kletzer, 1994, 16).

Lastly, a note about omitted worker characteristics and displacement that seem to be standard in other empirical works. Some studies include race and sex in their analysis of displaced worker job-search models. This study intends to focus exclusively on observations for white males in the DWS. The rationale for this omission is that discrimination effects could be introduced by these variables, distorting the results of the decomposition technique used to analyze regional structural components³.

B. Displaced job characteristics

In addition to the characteristics of the displaced worker, the characteristics for the job held at the time of displacement also impact the ability of the displaced worker to regain employment after displacement. Plant closure coincident with worker displacement,

² Keltzer identifies the internal job market as the promotion of managers from within the company. Such jobs are rarely advertised, compounding the impact of white-collar management displacement.

³ This convention is found in Herzog and Schlottmann (1994), based on the same rationale.

advanced notice of job displacement, and on-the-displaced-job tenure impact the odds of displaced worker reemployment.

1. Plant closure Plant closure intones a message of finality to the displaced worker. Once the plant is closed, there exists no hope that the plant will open again and the displaced workers will be rehired. Therefore, workers who have been dislocated due to plant closure will be more inclined to search for reemployment versus workers who lost their job to layoff. Conversely, workers displaced due to layoff entertain the hope that they will be rehired at some future date. Apriori, it is asserted that plant closure will augment the reemployment likelihood of displaced workers. This assertion is successfully tested in job-search models by Podgursky and Swaim (1987a) and Herzog and Schlottmann (1994).

2. Advanced notice The receipt of advanced notice enables displaced workers to improve their odds for reemployment. How advanced notice manifests itself has been the question of several empirical works regarding worker dislocation. Statistical treatment of advance notice attempts to establish a link between notification and increasing reemployment likelihood, minimal reemployment wage loss, shortened unemployment duration after displacement, and less job turnover⁴.

The microdata multivariate studies that focus on advance notice can be truncated into two groups based on the explicitness of the data. For the years 1984 and 1986, the

⁴ Reemployment likelihood, reemployment wage loss, post-displacement unemployment duration, and job turnover are traditional dependent variables in displaced worker investigations. While this investigation focuses on characteristics particular to the displaced worker and reemployment likelihood, the insights gained from the other aforementioned studies help develop understanding of the nature of the advanced notice debate contained in the displaced worker job-search literature.

DWS polled its respondents only to see if they had forewarning of displacement. This question did not differentiate between formal, written advance notice and informal notice. The 1988 DWS clarified this ambiguity by explicitly asking the length of advance notice and if the advance notice was written. This clarification made the interpretation of the role of advanced notice more concise in displaced worker analyses.

Controversy surrounds the inclusion of the role of advanced notice in the analysis of displaced workers. Proponents of advance notice policy argue that it will ease the shock of displacement and allow the worker to seek alternate employment. Advanced notice, they contend, would diminish extra burdens placed on local social services due to worker dislocation (Ehrenberg and Jakubson, 1989a, 62).

Opponents of mandated advanced notice argue that the result would be a restriction of capital mobility. Furthermore, plants that issue advance notice would be further crippled by increased turnover of highly skilled workers and decreased productivity of remaining workers. The good faith of distributors and lending institutions might be irreparably harmed by the firm's posting of advance notice. Lastly, detractors argue that legislated advance notice would encourage firms to limit their expansion or substitute overtime hours for additional employment (Weber and Taylor, 1963, 312-3). Policy wrangling is not an issue in this analysis, however, since the purpose of this investigation is concerned with the status of the displaced worker and not that of the displacing firm, the presence of advanced notice is viewed as a benefit (to the worker) and not a cost (to the firm), *ceteris paribus* (Weber and Taylor, 1963, 313).

Advance notice investigations conducted from the DWS are sometimes criticized on the claim that the data contains an endogeneity bias in the responses of the sampled dislocated workers. If this claim is true, the results would overstate or understate the role of advance knowledge. Endogeneity bias can enter the data in several ways. Workers likely to experience shorter spells of unemployment may presort themselves into jobs that provide advance notice. This action would overstate the role of advance notice's mitigation of joblessness (Addison and Portugal, 227, 1991). Too, firms in depressed regions, knowing that their workforce is less likely to quit prematurely, may be more inclined to issue advance notice. As these workers will experience reemployment difficulty, it would seem that advance notice does not have a marked influence on premature job flight. In contrast, workers living in healthy regions benefit from advance notice that allows them to seek reemployment, better wages, and minimize joblessness among a variety of options prior to displacement (Ruhm, 19, 1992).

3. Tenure Job tenure accumulated up to the time of displacement is positively related to post-displacement earnings. This positive return is likely to reflect heterogeneity in worker ability and the transferability of specific skills, but not heterogeneity in job/match quality. Particularly, tenure accumulated by blue-collar workers is less valuable to post-displacement search than tenure accumulated by white-collar workers. This distinction would be due to transferability of the skills gained through white-collar work (Kletzer, 1994, 541).

Displaced workers with a great degree of seniority will experience a greater wage loss than low seniority workers, even when the local labor market is doing well

(Carrington, 1993, 449). This is corroborated by an earlier study that reveals that there are gains in reemployment wage that can be linked to tenure. However, the marginal gains to increases in tenure increase at a decreasing rate over time (Addison and Portugal, 1991, 299).

C. Search characteristics

Conditions of local labor markets in which the displaced resides play an important role in shaping the post-displacement search conducted by the displaced worker. Displaced workers would experience smaller losses in terms of post-displacement outcomes (diminished duration of unemployment) if residing in economies that were growing (Carrington, 1993, 437). For this reason, the inclusion of state-level conditions that define the displaced worker's search is desirable. In addition to these state labor market conditions, other characteristics will also be considered that impact search, such as the receipt of unemployment insurance and migration.

1. Unemployment insurance Individuals who receive unemployment insurance (UI) prolong their job-search. Consequently, it is expected that the receipt of unemployment insurance payments will increase both the length of joblessness and the reemployment wage of the displaced worker. This is a standard job characteristic in empirical analyses of job-search theory for displaced workers and is seen in, but not limited to, Howland (1988), Ehrenberg, (1988), and Flaim and Sehgal (1984).

2. Migration This analysis of displacement and reemployment is concerned with migration as an option for labor to search for employment opportunity elsewhere. Displaced workers migrate to increase their odds of reemployment by leaving their present

depressed locale where job dislocation took place. One could infer that the number of migrating workers are being forced to move each year because of the push of economic dislocation at home, most notably including plant closings (Bluestone and Harrison, 1982, 103).

There is some controversy as to the results stated above. Other empirical works show that there exists a negative relationship between reemployment likelihood and migration. However, when migration is undertaken, additional search costs are imposed on the displaced worker that are recouped in the form of accelerated reemployment. Thus, reemployment likelihood and migration should be directly correlated (Herzog, Schlottmann, and Boehm, 1993, 329).

3. Metropolitan vs. rural Displacement in a metropolitan area allows the displaced worker the opportunity to search among many possible employers within a concentrated area. Hence, the reemployment likelihood of the urban displaced worker exceeds that of a rural displaced worker due to the reduced search cost per job-searched, given the concentration of employers in an urban area (Herzog and Schlottmann, 1995, 13).

4. Unemployment This analysis will use general unemployment figures adjusted for the percentage of workers who have been displaced⁵. Previous studies have shown the unemployment rate to have a significant inverse relationship with reemployment likelihood.

⁵ To capture regional structure, this study will use a decomposition methodology rather than explicitly account for regional structure in the econometric estimations. For this reason, it is desirable to expunge that portion of unemployment attributed to worker displacement in all estimations using the unemployment rate.

One such study uses several different measures of unemployment to capture the effects of unemployment on blue-collar and white-collar occupations. It was discovered that the general unemployment rate had a significant impact on the labor market outcomes of white-collar workers, but not blue-collar workers. The conclusion is that the reemployment likelihood of white-collar workers, in contrast to that of blue-collar workers, is influenced by conditions in all industries in the local economy (Howland and Peterson, 1988, 117). Addison and Fox (1993) discovered that the unemployment rate diminishes the job turnover among displaced workers who were dislocated because of plant closure. Other job-search studies, including Herzog and Schlottmann (1995) and Podgursky and Swaim (1987a and 1987b), utilize unemployment rates to demonstrate that the unemployment rate and reemployment likelihood are negatively related.

D. Timing of displacement

Empirical job-search literature shows the timing of displacement significantly affects the displaced worker's reemployment likelihood. A worker displaced in year "t-2" has a one-year lead on a worker displaced in period "t-1". It is therefore expected that one's reemployment likelihood in year "t" increases the earlier one is displaced, relative to those displaced later. This assertion has been empirically investigated in studies conducted by Podgursky and Swaim (1987a and 1987b), Addison and Fox (1993), and Howland and Peterson (1988).

Since this investigation will be using labor market outcomes to reveal changes in structure over time, data from the DWS will be pooled for the preliminary econometric

investigations. Each DWS utilized in the investigation contains data on displacement dating back three years prior to the date of data collection⁶.

III. Existing methodologies for assessing regional structural change

Assessment of regional structural change has received scant attention in regional theory and empirical analyses. A review of the economic literature revealed that there exist three such methodologies for assessing temporal regional structural change: the calculation of gross regional product differentials, shift-share analysis, and input-output tabulations. These existing methodologies for assessing regional structural change rely heavily on economic conditions at the national level. The proposed methodology in this investigation is a unique alternative to the existing methods designed to test regional structure as it does not rely on structural outcomes at the national level nor does it depend on the levels of output from each region or the nation. Again, it is important to remind the reader of the narrow definition of “structure” that is employed in this investigation. The temporal decomposition developed for this investigation uses the notion of structural change in a meticulous manner. Here, national or regional structural change is concerned with the dynamic technical structure of the nation over time, denominated in terms of changing reemployment rates as shaped by changing employer perceptions about displaced workers.

⁶ The 1986, 1988, 1990, and 1992 DWS contain data on displacement dating back five years prior to the date of data collection while the 1994 DWS contains data dating back only three years prior to survey. For the sake of uniformity, only those observations contained in the first four surveys describing workers displaced in the three years prior to the date of data collection were included in this analysis.

A. Gross regional product

Data for analyzing gross regional product (GRP) with an eye to regional structural change over time is relatively new when compared to other nation/state-level variables. Previously, it was difficult to establish a time series of output data at particular regional and industry levels due to sporadically published data with little regard to consistent tabulation. Because of this lack of data, the analysis of structural change using GRP has been limited in previous years. Now, GRP figures are available at two-digit SIC codes and for Census Regions and Divisions. Structural change assessment which uses GRP focuses on rates of change in real GRP and changing shares of real GRP by major industry sector (Connaughton and Madsen, 1990, 48-60).

However, these changes in GRP rates and industry shares as measure of regional structure offer no direct information on the region's ability to reemploy its workers. Using GRP differentials, one can only infer about reemployment within a region after judging from the output changes of the region as a whole and of particular industries. One cannot establish a direct link between regional reemployment opportunities and regional structure using the GRP method.

B. Shift-share analysis

The conventional approach to shift-share analysis assumes that regional growth rates can be explained by the growth rates for some reference region, usually the nation. It is recognized that the region and the nation will grow at different rates and shift-share analysis attempts to reconcile these differential growth rates into two separate components: an industry mix component and a competitive component. If each industry

in the region grew at the same rate as the industry at the national level, the region's share of each industry would remain unchanged over the period in question. Still, national growth rates for some activities are higher than others and it is this difference that will determine the pure industry mix effect. The competitive component is manifested when the region has the same mix of industries as does the nation. If industries in that region grow faster than the same industries at the national level, its overall growth rate will be higher than that of the nation (Hoover and Giarratani, 1984, 399).

Conventional shift-share analysis is flawed in one key respect. In the traditional shift-share calculations, tabulations permit a commingling of growth and regional structure components to the point that the share effect, the industry mix, and the competitive effect are all functions of regional structure. Secondly, conventional shift-share analysis is not equipped to separate growth effects from structural change, with this inseparability arising from the temporal change inherent in the reference economy used for the calculations (Kochanowski, et.al., 1989, 65-6). Many revisions have been offered (Esteban-Marquillas, Herzog and Olsen, Arcelus, etc.) on how to separate the calculated components of shift-share.

C. Regional input-output analysis

Regional input-output models can be designed in one of two ways depending on the detail in which imports and exports are recorded in the table of transactions. Some regional input output models are crafted in the spirit of a national input-output framework and even though this technique may contain a series of import and export columns, both trade figures are highly aggregated in this approach. A second approach disaggregates

import and export figures by industry and sector. This procedure does not include a column devoted to imports and exports; rather, imports and exports are summarized in tables that provide detailed interindustry transactions within the region and between the investigated region and other regions. For this reason, regional input-output analysis is particularly useful for conducting structural analysis (Miernyk, 1965, 65).

In general, input-output analysis has two distinct functions. First, it is a framework that shows the structural interrelations between industries and sectors and between inputs and outputs. Second, it serves as an analytical tool designed to measure the impact of an autonomous disturbance on structure as denominated in employment and income (Richardson, 1972, 14). This impact on employment and income arises as firms purchase goods from other industries along with their purchase of labor services. Regional input-output analysis permits one to consider the multiplier effect on these two regional aspects (Hewings, 1985, 36).

Regional input-output analysis is not without problems as a tool for assessing regional structural change. One of the major problems is that input-output models do not possess mechanisms for explaining trade patterns of the region (Richardson, 1972, 56). Also, there exists a scarcity of data available for input-output analysis at the regional level. This lack of data limits the usefulness of input-output coefficients for analytical purposes. Given the absence of regional data, output estimates are often obtained from regional output figures adjusted by national input coefficients. The resulting table of interindustry flows are based on the assumption that regional input patterns and national input patterns are the same and there is no guarantee that this is the case (Miernyk, 1965, 66).

Using input-output models to analyze structural change over time introduces a new set of criticisms. Statisticians responsible for tabulating input-output tables must be aware that temporal comparisons require data that has been consistently reported across time (Pieter and Broesterhuizen, 1986, 273). In addition, the coefficients utilized in a series of yearly input-output models suffer from bias due to factors deemed “external” to the production process due to a variety of reasons. These external distortions are linked to factors of a statistical nature⁷ and factors of a conceptual nature⁸, both of which affect the value and the configuration of the aggregates used in input-output analysis applications (Bruno, 1986, 285).

⁷ Bruno lists factors of a statistical nature that affect input-output analysis to include errors of observations, availability of statistical information, revised statistical definitions and accounting over time, and distortions from competitive imports.

⁸ Bruno notes that the definition of statistical units, aggregation of substitutable commodities, the heterogeneity of the prices of individual flows, and the introduction of institutional changes will affect cause distortions of a conceptual nature in temporal input-output analysis.

CHAPTER 3

DATA AND PRELIMINARY RESULTS

This analysis utilizes labor market outcomes of the displaced to gain insights regarding regional and national structural change over time. For this reason, this section starts with an overview of the displaced worker data used for this investigation. Along with this overview, tabulations using Current Population Survey (CPS) data taken from the five Displaced Worker Supplement (DWS) show the incidence of, and changes in, worker displacement for a particular region or the nation.

I. Displaced Workers Supplement to the Current Population Survey

The data set for this investigation will be comprised of microdata taken from the DWS to the CPS for the years 1986, 1988, 1990, 1992, and 1994. This supplement is assembled each January in even-numbered years¹, beginning with 1984, and is used to assess the predicament of the displaced worker. Questions regarding displacement are asked of persons age 20 or older who had lost their job involuntarily due to a decision made by their employer regarding plant closure, shift or position elimination, or slack work².

The CPS contains a variety of variables unique to describing the predicament of the displaced worker. Variables that are included in the CPS that are relevant to the model proposed for estimation include, but need not be limited to, worker characteristics

¹ The only exception to this date of publication is the 1994 DWS, which was collected in February of 1994.

² The displaced worker definition used in this paper is derived from the DWS. In the DWS, respondents are asked if they left a job involuntarily due to the previously cited conditions.

such as race, sex, age, education, occupation, and family status. Additionally, the DWS contains variables dealing with job loss and the post-displacement experience, such as displacement because of plant closure versus shift elimination, advance notification, tenure on job, weekly earnings on displaced job, and unemployment benefits. Information is available about characteristics of search after displacement and the timing of displacement. The DWS also contains geographic codes that allow for the inclusion of local labor market conditions and permit analysis of reemployment likelihood at a regional level.

This study will employ race and sex variables to cull observations particular to white-males. This is done to eliminate any discrimination effects that might distort the regional structural conclusions of the decomposition technique described in Chapter 5, Section I. The motive for the omission of this class of displaced workers is that this decomposition technique was originally used to assess discrimination by race and sex in a study conducted by Oaxaca (1973). By eliminating minority cohorts, discrimination effects are expunged from the final results.

Additionally, data that is used for tabulation in this study are restricted to workers who are seeking full-time reemployment. The rationale for this restriction is that regional structural conditions are better manifested in the labor market outcomes of workers who desire full-time reemployment than for those who do not seek full-time reemployment.

In its attempt to assess better the plight and conditions of the displaced worker, response options in the displaced worker supplements have become more explicit since the DWS inception in 1984. For this reason, incongruities exist between the responses tabulated in five data sets. However, these differences in no way hinder the inclusion of

data in this study's empirical investigation. The design of these data sets allows the user to tailor the data so that each variable culled from a particular data set is analogous to that variable taken from the other four sets.

It is unfortunate that the earlier DWS do not possess the explicitness of subsequent assessments. If earlier data sets were more comprehensive in their data collection, this study could have been more successful in controlling for factors that explained displaced worker reemployment. For an example that impacts this study: of the five DWS used for this investigation, the 1986 and 1988 DWS contain broad categories regarding the worker characteristic education. Later surveys have more information regarding education; instead of "year completed" as seen in the 1986 and 1988 surveys, later surveys permitted the respondent to answer with a variety of answers³. Also, the CPS elected to change the displacement time period included in the 1994 DWS. The 1994 DWS differs from the other four surveys as it investigates only a three year span of displacement versus the five year span of displacement included in the previous four DWS surveys. For the purpose of consistency, only those displaced three years prior to the survey were considered when analyzing the impact of displacement timing on the reemployment likelihoods of displaced workers.

II. Regional dimension of reemployment

Tables 3.1 through 3.3 provide information on the incidence of worker displacement and reemployment as tabulated in the 1986, 1988, 1990, 1992, and 1994

³ For example, later surveys included education results such as, "Associates degree", "Graduate work" or "Attended four year college, did not graduate". Such responses give this investigation better insights about the nature of displacement

Table 3.1
Regional Distribution of White-Male Worker Displacement:
Share of Displaced Relative to Share of United States Labor Force

	1983-1986	1985-1988	1987-1990	1989-1992	1991-1994
Northeast	.7639	.674	.8271	1.1166	1.053
Midwest	.9904	.9225	.9554	.827	.8151
South	1.1	1.18909	1.077	1.0397	.9451
West	1.09199	1.1126	1.1006	1.0278	1.2451
N	73,540	73,208	73,966	72,556	69,387

^a Compiled from the CPS-DWS, utilizing population weights provided in the microdata.

^b Reemployment ratews are only for those workers who were displaced 3 years prior to the tabulations of the DWS.

Table 3.2**Reemployment rates of displaced white-male workers seeking full-time employment^{a,b}**

Region	1986	1988	1990	1992	1994
United States					
Reemployment rates	71.37	77.38	78.1	66.72	73.93
N	1,773	1,613	1,305	2,018	1,496
Northeast Census Region					
Reemployment rates	65.65	73.73	69.38	59.3	68.95
N	341	278	296	576	427
Midwest Census Region					
Reemployment rates	70.63	76.14	69.68	66.4	76.52
N	475	416	310	445	324
South Census Region					
Reemployment rates	75.67	79.36	84.92	72.33	75.99
N	549	518	399	563	370
West Census Region					
Reemployment rates	69.59	77.95	83.78	66.46	73.88
N	408	401	300	434	375

^a Compiled from the CPS-DWS, utilizing population weights provided in the microdata.

^b Reemployment rates are only for those workers who were displaced 3 years prior to the tabulations of the DWS.

Table 3.3**Reemployment rates of all white-male displaced workers^{a,b}**

Region	1986	1988	1990	1992	1994
United States					
Reemployment rates	68.84	75.2	75.38	64.93	64.05
N	1,842	1,662	1,347	2,077	1,737
Northeast Census Region					
Reemployment rates	63.73	71.82	67.6	57.87	57.39
N	350	287	304	592	509
Midwest Census Region					
Reemployment rates	66.95	74.24	67.64	65.28	67.34
N	501	425	320	453	370
South Census Region					
Reemployment rates	73.396	77.01	81.34	69.67	64.05
N	566	533	414	440	583
West Census Region					
Reemployment rates	67.59	75.56	80.72	64.85	67.19
N	425	417	309	449	418

^aCompiled from the CPS-DWS, utilizing population weights provided in the microdata.

^bReemployment rates are only for those workers who were displaced 3 years prior to the tabulations of the DWS.

DWS. Observations from each DWS have been assigned to the four Census Regions based on state of residence in year of assessment.

For each region and for the nation, the index in Table 3.1 is equal to the regional share of United States displaced workers divided by the regional share of the United States labor force.⁴ Calculations exceeding 1 indicate that the region's share of displaced workers exceeds the conditions that prevail at the national level. Judging from this table, it appears that after 1989, the Northeast had a greater share of displaced workers than did the nation. The South and the West appear to have a share of displacement greater than the national share during the sampled span of time; only in 1991 to 1994 did the South have a share of displacement that was less than the nation. The share of displacement in the Midwest always fell short of the share of displacement that took place at the national level during 1983-1994. Table 3.1 compiles information particular to a region or the nation. The purpose of this table is to compare displaced workers to the general population. Data for the population-at-large comes from the standard portion of the Current Population Survey.

Table 3.2 list reemployment rates for white-male displaced workers who either held or where seeking full-time employment.⁵ Table 3.3 summarizes the reemployment figures for all white-male displaced workers. In both tables, reemployment rates are

⁴ To define, "share" is the number of those observed in a region with a particular characteristic divided by the number of those observed in the nation with the same characteristic.

⁵ Full-time employment is defined as 35 hours of work per week or more.

expressed as percents, and represent reemployment status of worker displaced in previous years.⁶ Inspection of each table reveals that the passage of time impacts each region differently in terms of reemployment likelihood. All national and regional reemployment rates improve between 1986 and 1988. This improved reemployment trend continues over another two years for the nation, and this outcome is fueled exclusively by the favorably changing reemployment rates of the South and West regions. Between 1990 and 1992, reemployment rate differentials indicated declining reemployment odds at both national and regional levels. This trend is reversed between 1992 and 1994; in these final two years all reemployment rate differentials improve, with the exception of workers seeking full-time and/or part-time reemployment in the South or Northeast.

Though many of the reemployment rate differentials improve or decline concurrently during the same period, none of the reemployment rate differentials in Tables 3.2 or 3.3 change by the same magnitude. This investigation explains these divergent reemployment rate differentials, concluding that unique regional forces are at play which affect changing displaced worker reemployment. These temporal differences in reemployment rates will be bifurcated between the job-search attributes possessed by displaced workers and the perceptions that employers have about the job-search attributes possessed by displaced workers.

⁶ As the final analyses in this study will deal only with the full-time white-male cohort, table tabulations in Chapter 5 deal exclusively with the reemployment of workers summarized in Table 3.2. Table 3.3 has reemployment rate for the white-male cohort and will only be used in the sensitivity analysis section contained in Chapter 6. Investigation of the reemployment rate differentials in 3.3 will demonstrate the impact on decomposition results that arises from redefining the data set used in the study.

CHAPTER 4

ECONOMETRIC ESTIMATION

To investigate the plight of displaced workers, two sets of estimates were obtained for the job-search models discussed in Chapter 2. The initial or preliminary estimates made use of all five aforementioned CPS-DWS data sets, controlling for job-search characteristics, worker characteristics, displaced job characteristics, and displacement timing. Such estimates were obtained to assess whether or not labor market outcomes of the displaced class of workers varied across the polled data sets. Upon finding that the period of displacement had relevance to the reemployment of the displaced,¹ a second round of estimates were obtained. This final set of regional equations made use of the equivalent displacement characteristics included in the preliminary investigation, however, separate estimates were obtained for each year of assessment.

Both the preliminary and final investigations include the same time period from each survey.² However, the final equations chart national and regional change as it occurs over time as manifested in labor market outcomes. The goal of this investigation is to dismantle these national and regional labor market outcomes into what is referred to as changes in structural and endowment components between time periods for the nation and regions. The endowment component represents the temporal difference in reemployment likelihood attributed to changing characteristics of workers in a particular region. The

¹ These results are described in detail in section 4.1.

² Only workers displaced three years prior to survey date are included in this study.

structural component represents the temporal difference in reemployment likelihood attributed to the changing perceptions of employers about the skills of the workers.

I. Preliminary econometric estimates

To initiate this study, a series of preliminary logit regressions demonstrates that it is justifiable to investigate time trends in regional structure as manifested by reemployment likelihood. The results of these preliminary regressions are included in Table 4.1 for the nation and census regions. These results relate the reemployment status of displaced workers to a bundle of displaced worker conditions and the timing of the survey's tabulation.

Preliminary logit estimation will be designed with the following form:

$$T = \beta'X + \delta_1 + \delta_2 + \delta_3 + \delta_4 \quad (1)$$

In statement (1), T is a vector of binomial job-search outcomes, β is a vector of characteristic coefficients on X , which is a vector of job-search, individual, and displaced job characteristics. The binary regressors δ_1 through δ_4 represent four of five years of displacement assessment that will be used in this study to investigate temporal structural change. To analyze regional reemployment likelihood relative to 1986, the first year of assessment,³ statement (1) will be estimated for the United States and the four Census regions: Northeast, South, Midwest, and West.

The purpose of the binary regressors is to introduce a time pattern of reemployment likelihood into these preliminary models that will be estimated for each region and the nation. In these estimated equations, endowments or characteristics are

³ In the estimates, binary variables are included which account for all years of assessment with the exception of the DWS year of assessment in 1986.

allowed to change over time and the structure or coefficients are assumed to be stable over time. The resulting interpretation is that δ_1 through δ_4 , which represent the year of displacement assessment,⁴ capture temporal changes in regional reemployment likelihood that cannot be assigned to changes in characteristics. For example, if the estimation of (1) for a region yields the result: $\delta_1 > \delta_2 > \delta_3 > \delta_4 > 0$, then one could conclude that reemployment likelihood increases over time after controlling for temporal endowment changes.⁵ This demonstrated change in reemployment likelihood is attributed to structural change within the region over time. Comparisons between the Census regions and the nation are conducted using the time patterns exhibited by these estimated δ coefficients.

The above model for the combined data taken from the 1986 to 1992 DWS considers the 1986, 1988, 1990, 1992, and 1994 reemployment likelihood of white-male workers displaced over a thirteen-year span. Binary logit estimates are summarized in Table 4.1 and relate to all displaced workers that are seeking full-time reemployment. This table includes estimates for the nation and the four Census Regions: the Northeast, the Midwest, the South and the West.

Looking initially at the national tabulations in column (1), consider first the worker characteristics in the job-search equation. Note that the reemployment prospects are diminished as a worker increases in age. Also, it appears that higher levels of education, relative to an incomplete high school education⁶ and/or marriage afford the displaced

⁴ The year of assessment is the year in which the DWS is administered in conjunction with the CPS.

⁵ Here, $t=1$ is the second year of assessment (1988) and $t=4$ is the last, or most recent, year of assessment (1994). The earliest year of assessment (1986) has been omitted from the estimates, hence discussion of δ_1 , δ_2 , δ_3 , and δ_4 is relative to assessment in 1986.

⁶ Of the levels of education included in the preliminary analysis, those displaced workers who failed to complete high school are omitted from the estimates. The same is true for the final estimates.

Table 4.1
Preliminary analysis^a: Determinants of Employment for White Males Displaced
Between 1983 and 1993 for the United States and the Four Census Regions
Who are Seeking Full-Time Reemployment

Variable	United States	Northeast	Midwest	South	West
Equation intercept	2.737***	3.167***	3.2784***	2.6118***	2.7629***
Worker Characteristics:					
Age	-0.0188***	-0.0197**	-0.0178**	-0.0227***	-0.0171**
Age above fifty	-0.0015	-0.000558	-0.00509	0.00411	-0.00469
Education					
High school graduate	0.4161***	0.4884***	0.4626***	0.3228**	0.5647***
Up to four years of college	0.75***	0.7275***	0.7887***	0.6447***	0.9185***
More than four years of college	0.8443***	0.7571***	1.2736***	1.0775***	0.7884***
Married	0.462***	0.5639***	0.3817***	0.548***	0.3348***
Occupation					
Managerial or professional	0.2503*	0.3814	-0.00996	0.3846	0.2049
Technical, sales or administrative	0.2983**	0.5366**	0.138	0.5117**	0.0364
Precision production, craft or repair	0.00041	0.0081	-0.2103	0.3333	-0.1857
Operator, fabricator, or laborer	-0.1112	-0.2679	-0.4801*	0.3051	0.0287
Displaced Job Characteristics:					
Plant closure	0.3303***	0.4292***	0.3283***	0.3388***	0.2402*
Received advanced notice	0.1437**	0.0969	0.1436	0.2685**	0.0815
Tenure	-0.00382	-0.011	0.00531	-0.0114	0.0173
Weekly earnings	0.0003	0.00048	-0.000248	0.00046	0.00018
Search Characteristics:					
Population	-0.00809**	-0.0299***	-0.0321*	0.0283***	-0.007
Unemployment rate ^b	-0.1777***	-0.0862	-0.1972***	-0.1511***	-0.1554***
Urban area	0.1465**	-0.0662	0.3755***	0.1656	-0.0314
Job-search related move	0.3238***	0.1026	0.5188***	0.2689*	0.2682*
Received UI	-0.6279***	-0.9616***	-0.4781***	-0.603***	-0.4721***
Region					
Midwest	0.2612***				
South	0.547***				
West	0.449***				
Displacement Timing:					
One year for reemployment search	-1.7197***	-2.0184***	-1.7318***	-1.6934***	-1.568***
Two years for reemployment search	-0.2494***	-0.5342***	-0.1919	-0.1001	-0.2668
Year of assessment					
1988	0.0476	-0.0064	0.1792	-0.0961	0.2173
1990	-0.00565	0.0715	-0.3849	0.1834	0.5668**
1992	-0.5756***	-0.4534**	-0.7348***	-0.5743***	-0.3819**
1994	-0.0177	-0.3207	0.3421	-0.3834	0.3462
N	8,205	1,918	1,970	2,399	1,828

*t-test significant at the 0.10 level

**t-test significant at the 0.05 level

***t-test significant at the 0.01 level

^aThe log likelihood ratio test statistic is significant at the one percent level in each of the five models

^bUnemployment figures are adjusted for % displaced

worker improved reemployment opportunities, the former in a step-wise pattern through the completion of and studies beyond a four-year degree. Lastly, it appears that workers that were displaced from white-collar occupations⁷ fare well at the national level in their quest for reemployment.

Among the displaced job characteristics, plant closure and advance notice favorably impact the reemployment of displaced workers. Plant closure adds a measure of finality to the displacement and advance notice prepares the displaced for dismissal, hence both factors aid in increasing the odds of reemployment for a displaced worker.

Among those attributes that characterize the search process of the displaced worker, it was discovered that the unemployment rate for the state of residence at the time of survey (adjusted for those unemployed who were displaced), the receipt of unemployment insurance, and the population of the area of assessment significantly hinder the prospects of those displaced workers seeking reemployment. Conversely, those whose displacement was assessed in an urban area and/or those relocating coincident with displacement and subsequent job-search, fare better in their pursuit of reemployment.

Overall, the length of time since displacement increases the odds of reemployment for displaced workers. This is captured in this investigation by noting when displacement occurred during the three years prior to assessment. The inclusion of displacement timing reveals that United States workers displaced closer to the time of assessment have a more difficult time securing reemployment. Workers that are displaced closer to the time of

⁷ This study uses five classes of occupations as defined by the DWS: 1.) managerial or professional, 2.) technical, sales, or administrative, 3.) precision production, craft or repair, and 4.) operator, fabricator, or laborer. The author feels that these titles become cumbersome in use and will often refer to 1.) and 2.) as "white-collar" and 3.) and 4.) as "blue-collar".

assessment have less time to search for a job than their counterparts displaced two and three years prior to survey date, hence it is less likely that they will be employed at the time of displacement appraisal.

Also, the year of assessment impacts the odds of reemployment for the displaced worker in the United States. Apriori, there is no clear-cut view as to how the year of assessment will affect displacement.⁸ This is because the year of assessment included in the preliminary regressions is designed to capture the impact of temporal changes on reemployment. Only in 1992 does the year of assessment significantly reduce reemployment likelihood for the displaced workers included in this study.

Binary variables representing Census Regions (Midwest, South, and West) were included to assess the impact of geographic location of worker displacement on reemployment. The results seem to indicate that workers residing in the Midwestern, South, and Western Census Region fare better, in terms of reemployment, than their counterparts in the Northeast Census Regions, *ceteris paribus*. The significance of all the regional variables included in this analysis indicate that the investigation of worker displacement at the regional level is appropriate.

To investigate regional displaced worker joblessness and reemployment, individual estimations were conducted for population subsets from the Northeast, Midwest, South, and West Census Regions. These results are summarized in Table 4.1 by region. Concerning the characteristics of the worker, age negatively impacted the odds of a displaced worker finding reemployment. In the West, this relationship between age and

⁸ To restate, there is no apriori sign for the coefficients estimated for "Year of Assessment".

reemployment was quite acute; displaced workers over the age of 50 experienced a significantly increased difficulty when locating reemployment. Across the four regional subsets, it was discovered that marriage and/or education increased the likelihood of reemployment post-displacement. Like the nation, workers with higher levels of education in all Census Regions had better odds for reemployment. Displaced workers with high school diplomas and/or four-year degrees fared better at reemployment than counterparts possessing an incomplete high school education. Furthermore, graduate school education beyond the four-year undergraduate degree significantly aided displaced workers dwelling in all regions in their search for reemployment. Lastly, it appears that, like the nation, white-collar employees displaced from technical, sales or administrative positions in the Northeast and the South Census Regions found post-displacement reemployment odds to be improved. Meanwhile, Midwestern blue-collar workers displaced from precision production, craft, or repair work experienced reduced reemployment odds.

The regional impacts of displaced job characteristics on reemployment were corroborated by aforementioned a priori expectations and estimates at the national level (estimates tabulated in Table 4.1). Plant closure increased the potential for reemployment among workers in all Census Regions included in this investigation. Only workers in the South benefited, in terms of reemployment, from the advanced warnings about plant closure.

Among the characteristics of search and search location, population in the state of residence reduced the reemployment chances of displaced workers in the Northeast and

Midwest, while it increased the odds of reemployment for the displaced searching for reemployment in the South Census Region. In the Midwest, displaced workers dwelling in urban areas realized improved reemployment odds. In all regions other than the Northeast, the state unemployment rate (adjusted for displaced workers) indicates that reemployment opportunities are diminished by the presence of high joblessness. For displaced workers in all regions, the prospect of reemployment is reduced by the receipt of unemployment insurance benefits. Lastly, displaced workers in the Midwest, South and Western regions enhanced their outlook for reemployment if they made a post-displacement relocation.

The regional subset estimates included binary variables to control for the year of worker displacement and year of assessment of worker displacement. Like the nation, those displaced workers with only one year for reemployment search had a lower reemployment likelihood than those displaced workers who had more than a year⁹ to seek reemployment. This indicates that workers, regardless of region, with less time to search will have poorer reemployment opportunities than those workers who have more time to conduct a lengthy job-search.

For all regional estimations, the estimated coefficients for the date of assessment control for regional time trends in the displacement data. Like the national estimations, there is no apriori sign for these binary variables. Instead, these variables serve to incorporate a time trend into the study. Interestingly, the only significant year of assessment for all the regional estimates is 1992; it would seem that the economic

⁹ To clarify, workers with two to three years for search had better odds for reemployment.

conditions of that period were so severe as to reduce reemployment likelihood. Also, economic conditions were such in the West during 1990 that the odds of reemployment significantly improved during that period for that region.

By conducting this aforementioned investigation using data on displaced labor, regional and national histories can be crafted that focus on changing reemployment opportunities over time, particularly between the years 1986 and 1994. These changes in reemployment opportunities can then be separated into structural and endowment effects at the national and regional level that contribute to the reemployment likelihood of displaced workers.

To construct these narratives, the steps are two-fold. First, a series of job-search equation estimates must be conducted at the national and regional level by year of displacement assessment. Second, using the decomposition technique alluded to in previous sections and explained in Chapter 5, the estimated reemployment likelihood of displaced workers can be divided into constituent structural and endowment components for the region and the nation.

II. Primary econometric estimates

Acting upon the insights gained from the preliminary analysis above, a second round of equations will be estimated for the reemployment likelihood of displaced workers. Letting "T" denote whether or not a displaced worker holds a full-time job:

$$T = \beta'X \quad (2)$$

where β is a vector of parameter estimates and X is a vector of individual, displaced job, job-search, and displacement timing characteristics. Using subsets of observations from

each DWS, statement (2) will be estimated for each of the Census Regions and the United States by year of assessment.

The results of these subset estimates are contained in Tables 4.2 through 4.6. Each of these tables is devoted to estimates for a particular Census Region (Northeast, Midwest, South, West) or for the United States. Each coefficient table contains information for each year of displacement assessment; for each region and the nation, estimates were conducted for displaced workers surveyed in 1986, 1988, 1990, 1992, and 1994. The slate of variables used in the preliminary study were included unaltered in the final equation estimations with one exception; only the year of assessment was removed.

A. United States

For the temporal equations estimated for the United States (results are summarized in Table 4.2), age reduced the odds of reemployment for the displaced worker in all years except 1990. Conversely, marriage increased the chances of reemployment for displaced workers in all years assessed. In all years except 1988, displaced workers with a high school diploma experienced significantly increased reemployment opportunities relative to those without a high school education. This is also true for displaced workers possessing an undergraduate education; displaced workers who attended college for four years fared significantly better than their counterparts who failed to finish high school. Lastly, with the exception of 1990, displaced workers who attended school beyond the baccalaureate degree had better odds of reemployment than workers who did not complete high school. In addition to these worker characteristics, occupation also affected reemployment likelihood of the displaced workers. Workers at the national level who suffered

Table 4.2

**Primary analysis^a: Determinants of Employment for Displaced White Males
In the United States**

Variable	1986	1988	1990	1992	1994
Equation intercept	2.3715***	3.3979***	2.5076***	2.491***	2.3741***
Worker Characteristics:					
Age	-.017*	-.0368***	-.0138	-.0179**	-.0173*
Age above fifty	.00216	-.00284	.00175	.000058	-.00344
Education					
High school graduate	.579***	.2372	.8784*	.4549***	.671***
Up to four years of college	.882***	.69***	.5781***	.8805***	.972***
More than four years of college	1.2447***	.9636**	-.112	.825***	1.444***
Married	.4379***	.4394***	.456***	.4219***	.553***
Occupation					
Managerial or professional	.027	.5021	1.0275***	-.3235	.3115
Technical, sales or administrative	.2577	.5365	.941***	-.2206	.3161
Precision production, craft or repair	-.2434	.2934	.9125***	-.565**	-.0125
Operator, fabricator, or laborer	-.4633*	.2275	.649**	-.5852***	.0615
Displaced Job Characteristics:					
Plant closure	.3765***	.5195***	.2896*	.3553***	.1320
Received advanced notice	.3847***	.0856	-.1695	.1404	.1881
Tenure	-.000131	.0227**	-.033**	-.00402	.0139
Weekly earnings	.0179	.0437	-.0441	.0108	.00029
Search Characteristics:					
Population	-.00476	-.00541	-.00465	.0102	.0109
Unemployment rate ^b	-.137***	-.2228***	-.1792**	-.1769**	-.1708***
Urban area	.1344	.1234	.4524**	.2004	-.1108
Job-search related move	.4738***	.2316	1.0696***	.1162	.1081
Received UI	-.5238***	-.8624***	-.9755***	-.4739***	.5708***
Region					
Midwest	.1809	.625***	-.1484	.1552	.5209***
South	.547***	.7137***	.6213***	.5534***	.3737**
West	.0808	.6143***	.5312**	.3717**	.6731***
Displacement Timing:					
Year of Displacement					
One year prior to survey	-1.8219***	-2.0461***	-2.0206***	-1.6866***	-1.474***
Two years prior to survey	-.3028	-.3999*	.0190	-.4484***	.0463
N	1,773	1,613	1,305	2,018	1,496

*t-test significant at the 0.10 level

**t-test significant at the 0.05 level

***t-test significant at the 0.01 level

^aThe log likelihood ratio test statistic is significant at the one percent level in each of the five models

^bUnemployment figures are adjusted for % displaced

Table 4.3
Primary analysis^a: Determinants of Employment for Displaced White Males
In the Northeast Census Region

Variable	1986	1988	1990	1992	1994
Equation intercept	2.6112***	5.9104***	2.5715***	.6929	4.4474***
Worker Characteristics:					
Age	-.0104	-.0803***	.00732	-.00699	-.0521***
Age above fifty	.0043	.00673	-.0168	-.00539	.0131
Education					
High school graduate	.7012*	-.2198	-.5473	1.1175***	.7782**
Up to four years of college	.9763**	.0975	.2913	1.3111***	1.2563***
More than four years of college	1.805**	-.304	-.8746	1.3803**	1.8344**
Married	.5143	1.0339**	.5255	.5665**	.7557***
Occupation					
Managerial or professional	.6901	3.3633***	1.1287*	-.6473	.1576
Technical, sales or administrative	1.1641*	2.6083**	2.0330***	-.2459	.3458
Precision production, craft or repair	-.4143	1.7127	1.189**	-.8286*	-.2588
Operator, fabricator, or laborer	-.4528	.8905	.8703	-.7434*	-.043
Displaced Job Characteristics:					
Plant closure	1.2841***	.9291**	.1416	.5651**	-.1297
Received advanced notice	.4928	.0651	-.9865***	.0636	.5725**
Tenure	-.0384	.0193	-.0323	-.000549	-.0245
Weekly earnings	.0427	-.00243	.098	.0549	.00082
Search Characteristics:					
Population	-.0782***	.0121	-.0181	-.0284	-.0401**
Unemployment rate ^b	-.1236	-.2161	.0303	.2176	-.2268
Urban area	-.4804	-.1553	.6055	.3238	-.4805
Job-search related move	-.3569	.1216	.5645	.6768*	-.528
Received UI	-.8069***	1.364***	-.8212**	-.8565***	-1.0381***
Displacement Timing:					
Year of Displacement					
One year prior to survey	1.8238***	-3.9306***	-3.042***	-2.1564***	-1.4077***
Two years prior to survey	.3405	-2.6782***	-.3776	-.9531***	-.0453
N	341	278	296	576	427

*t-test significant at the 0.10 level

**t-test significant at the 0.05 level

***t-test significant at the 0.01 level

^aThe log likelihood ratio test statistic is significant at the one percent level in each of the five models

^bUnemployment figures are adjusted for % displaced

Table 4.4
Primary analysis^a: Determinants of Employment for Displaced White Males
In the Midwest Census Region

Variable	1986	1988	1990	1992	1994
Equation intercept	5.2316***	3.8629***	2.4093	2.6468**	2.4158*
Worker Characteristics:					
Age	-.0585***	-.0096	-.0212	-.0089	-.00352
Age above fifty	.0106	-.00848	.00445	-.0145*	-.0137
Education					
High school graduate	.6968**	.3017	.4271	.3985	.7063
Up to four years of college	.8326**	.7487*	.3883	.8148*	1.1189**
More than four years of college	1.9485**	.7796	.3363	1.1115	1.954
Married	1.0622***	.0445	.0911	.366	.422
Occupation					
Managerial or professional	-1.0345	.5838	.9660	-.6979	.4016
Technical, sales or administrative	-.2614	.1175	.7533	-.4486	.4536
Precision production, craft or repair	-.8862	-.1995	.7004	-.8359	.1947
Operator, fabricator, or laborer	-1.5236*	-.2078	.3420	-1.0297*	-.0407
Displaced Job Characteristics:					
Plant closure	.5696*	.3305	.4577	.226	.1192
Received advanced notice	.4914*	-.00157	-.0521	.2223	-.3411
Tenure	.00873	.00162	-.0405	.0156	.0348
Weekly earnings	.0611	.1049	.1255	-.0816	.000757
Search Characteristics:					
Population	.0146	-.0135	-.0799	-.0764*	-.0111
Unemployment rate ^b	.3178**	-.2493***	-.00239	-.1223	-.2781*
Urban area	.2611	.1881	-.0547	.7418***	.6434
Job-search related move	.3086	.0202	.9902**	.4556	1.7407**
Received UI	-.4728	-.8010***	-.8851***	-.0471	-.3047
Displacement Timing:					
Year of Displacement					
One year prior to survey	-2.1733***	-2.0360***	-.18935	-1.5178***	-1.5173***
Two years prior to survey	-.5922	-.4192	-.2061	-.2105	.6808
N	475	416	310	445	324

*t-test significant at the 0.10 level

**t-test significant at the 0.05 level

***t-test significant at the 0.01 level

^aThe log likelihood ratio test statistic is significant at the one percent level in each of the five models

^bUnemployment figures are adjusted for % displaced

Table 4.5
Primary analysis^a: Determinants of Employment for Displaced White Males
In the South Census Region

Variable	1986	1988	1990	1992	1994
Equation intercept	2.4022***	3.7803***	3.0213	2.8367***	1.771
Worker Characteristics:					
Age	-.00899	-.0567***	-.00345	-.0385**	.0122
Age above fifty	-.0024	.00497	.0151	.0162**	-.00785
Education					
High school graduate	.3192	-.00311	1.9727*	.3037	.7459*
Up to four years of college	.8986***	.46889	.9469**	.8255**	.5065
More than four years of college	1.6265*	1.4328*	.4744	.8593	1.069
Married	.1581	.7717***	.9277**	.4856**	.7375**
Occupation					
Managerial or professional	-.0316	.5326	2.0279**	.3731	.2646
Technical, sales or administrative	.7415	-.6923	.6282	.2441	-.0313
Precision production, craft or repair	.0198	-.8426*	.6268	.3026	-.1825
Operator, fabricator, or laborer	.2815	.6382	.8225	-.0958	-.265
Displaced Job Characteristics:					
Plant closure	.1620	.8064***	.0496	.4951**	-.0044
Received advanced notice	.4921**	.2187	.4727	.2256	-.0204
Tenure	.0112	.0196	-.0298	-.014	-.0433*
Weekly earnings	-.0238	.0192	.1830**	-.00165	.00044
Search Characteristics:					
Population	.0224	.00007	.0132	.0714***	.0183
Unemployment rate ^b	-.1176**	-.2033***	.2773	-.2347*	-.1456
Urban area	.3727	.145	.7923**	-.1205	.0551
Job-search related move	.6736	.3309	1.9418**	-.3247	.2759
Received UI	-.4951**	-.8411***	-1.5036***	-.33	-.5706**
Displacement Timing:					
Year of Displacement					
One year prior to survey	-2.0498***	-1.6741***	-2.1949*	-1.689***	-1.7236***
Two years prior to survey	.5623	.0274	.5697	-.00251	-.306
N	549	518	399	563	370

*t-test significant at the 0.10 level

**t-test significant at the 0.05 level

***t-test significant at the 0.01 level

^aThe log likelihood ratio test statistic is significant at the one percent level in each of the five models

^bUnemployment figures are adjusted for % displaced

Table 4.6
Primary analysis^a: Determinants of Employment for Displaced White Males
In the West Census Region

Variable	1986	1988	1990	1992	1994
Equation intercept	-.2892	3.1944*	4.5108**	4.8105***	3.8398**
Worker Characteristics:					
Age	.0102	-.0292	-.0356	-.0274	-.0392*
Age above fifty	-.00553	-.00999	.00798	.00028	-.00113
Education					
High school graduate	1.1910***	.9433**	.6475	.0628	.9835**
Up to four years of college	1.0925***	1.4177***	.5629	.9048**	1.3694***
More than four years of college	.9664	1.1218	.1753	.5395	1.8139**
Married	.2682	.3211	.5466	.2822	.4085
Occupation					
Managerial or professional	.3713	-.5876	1.0046	-.3746	.5516
Technical, sales or administrative	-.3117	-.3556	1.0152	-.4115	.6077
Precision production, craft or repair	-.4507	-.5369	1.2001**	-.9527**	.1627
Operator, fabricator, or laborer	-.4376	-.0368	.8105	-.5573	.7487
Displaced Job Characteristics:					
Plant closure	-.2842	.2193	.6279	.1323	.879**
Received advanced notice	.1606	.1740	-.1305	.1858	.0485
Tenure	.0354	.0839**	-.0378	.00888	-.00321
Weekly earnings	-.000873	.0543	-.01	.0557	.00032
Search Characteristics:					
Population	.0273*	-.00323	-.014	-.0197**	.00158
Unemployment rate ^b	.0605	-.2343	-.6156	-.3618**	.2018
Urban area	.2850	.338	.4528	-.1146	-.7837*
Job-search related move	.6950**	.3872	.7332	-.3020	-.1371
Received UI	-.3046	-.5026*	-.861	-.7249***	-.2792
Displacement Timing:					
Year of Displacement					
One year prior to survey	-1.6503***	-1.8461***	-1.4541***	-1.5778***	-1.8213***
Two years prior to survey	-.2207	.1477	-.1604	-.7943**	-.4976
N	408	401	300	434	375

*t-test significant at the 0.10 level

**t-test significant at the 0.05 level

***t-test significant at the 0.01 level

^aThe log likelihood ratio test statistic is significant at the one percent level in each of the five models

^bUnemployment figures are adjusted for % displaced

displacement from blue-collar occupations as operators, fabricators, or laborers were less likely to gain reemployment in 1986 and 1992. In fact, all blue-collar labor experienced decreased odds of reemployment in 1992; in addition to the aforementioned class of workers, blue-collar workers employed in precision production, craft or repair work had decreased odds of reemployment in 1992. In 1990, however, all workers experienced significantly increased reemployment odds, regardless of their occupation. Characteristics of the displaced job were important in the determination of the displaced worker reemployment for the United States. The finality of plant closure increased the chances of reemployment at the national level for displaced workers in all years except for 1994. Additionally, the likelihood of reemployment in 1986 is also increased by advanced notification about displacement. Interestingly, high levels of tenure on the displaced job decrease reemployment probability in 1990 while high levels of tenure accrued at the displaced job serve to increase the reemployment odds of displaced workers in 1988.

As an economic indicator and a characteristic of the search, high unemployment rates (adjusted for unemployed displaced workers) bode poorly for the reemployment of displaced workers in all years of assessment. Likewise, this is also the case for the receipt of unemployment insurance benefits in all years except 1994, which serve to lower the possibility of reemployment for the displaced class of workers. In 1994, unemployment insurance significantly increases the reemployment likelihood of displaced workers. Workers residing within a urban area had a better chance for reemployment in 1990 than their non-urban counterparts. Also, a post-displacement job related move aided workers in finding new jobs in both 1986 and 1990 at the national level.

Binary variables representing Census Regions (Midwest, South, and West) were included to assess the impact of geographic location of worker displacement on reemployment for each yearly subset. The results seem to indicate that workers who were displaced in the South Census Region fared better, in terms of reemployment, than their counterparts in the Northeast Census Region in all years assessed. Workers in the Midwest Census Region discovered that their odds of reemployment were significantly superior to the Northeast in years 1988 and 1994. In the West Census Region, displaced workers had better odds of reemployment in all years of assessment with the exception of 1986.

Lastly, the temporal subset estimates included binary variables¹⁰ to control for the year of worker displacement at the national level. Workers who were displaced one year prior to assessment had diminished odds of reemployment relative to workers displaced three years prior to assessment, regardless of the year in which their displacement was assessed. This was somewhat true for workers displaced two year prior to assessment; in 1988 and 1992 such workers had diminished odds of reemployment relative to workers displaced three years prior to displacement assessment. This indicates that reemployment odds decrease when workers had less available time to search for a job.¹¹

B. Northeast Census Region

For the temporal equations calculated for the Northeast Census Region (results are summarized in Table 4.3), age lowered the odds of reemployment for the displaced

¹⁰ In this study, binary variables have been coded for displacement one, two, and three years prior to assessment. The binary variable associated with displacement three years prior to assessment is omitted from the estimates

worker in 1988 and 1994. Completion of and schooling beyond high school education improve reemployment odds. With the exception 1988 and 1990, Northeastern workers who completed high school, worked towards/completed a four-year degree, or attended graduate school enjoy improved reemployment opportunities when compared to their displaced counterparts who did not graduate from high school. Likewise, marriage increased the chances of reemployment in 1988, 1992, and 1994 for displaced workers in the Northeast. Furthermore, workers in the Northeast who suffered displacement from white-collar sector occupations were more likely to gain reemployment in 1988 and 1990. This is also true of blue-collar workers in 1990 who were once employed in precision production, craft, or repair work. In 1992, however, displaced blue-collar workers have a more difficult time securing reemployment due to reduced reemployment opportunity.

Characteristics of the displaced job were important in the determination of the displaced worker reemployment in the Northeast region. The finality of plant closure increases the chances of reemployment in the Northeast for displaced workers in 1986, 1988 and 1992. Moreover, the likelihood of reemployment in 1990 and 1994 is heightened by advanced notification concerning displacement.

As a state level search characteristic, high population in region of residence decreases the reemployment prospects of displaced workers in 1986 and 1994. Likewise, this is also the case for the receipt of unemployment insurance benefits; unemployment benefits reduce the likelihood of reemployment for displaced worker in all years assessed.

¹¹ This cannot be said with overall certainty for some of the coefficients are both insignificant and incorrect in sign.

Conversely, displaced workers who commit to a post-displacement job-search related move have improved odds of reemployment in 1992.

Lastly, the temporal subset estimates included binary variables to control for the year of worker displacement in the Northeast. With the exception of 1986, workers displaced later (in the year prior to assessment) had a more difficult time regaining employment, relative to those workers who were displaced earlier (three years prior to assessment). Likewise, displaced workers who had been displaced two years prior to 1988 and 1992 realized reduced reemployment odds, relative to those workers displaced three years prior to 1988 and 1990. This indicates that workers with less time to search (i.e., workers that are displaced nearer to the year of assessment) will have poorer reemployment likelihood's than those workers who have more time to conduct a lengthy job-search.¹²

C. Midwest Census Region

For the equations tabulated for the Midwest Census Region (results are summarized in Table 4.4), age lowered the chances of reemployment for the displaced worker in 1986. Conversely, the odds for reemployment in 1986 were enhanced for displaced workers in the Midwest if married. In 1986, attained education levels meeting or exceeding a high school diploma increased reemployment likelihood's for displaced workers in the Midwest when compared to those displaced workers who had not finished high school. This is also true for displaced workers possessing a four-year degree in 1988, 1992, and 1994. This subgroup of workers fared better than their displaced counterparts

¹² Again, this assertion cannot be made for all years of displacement prior to assessment. While all the estimates are correct in magnitude and sign, some are statistically insignificant.

who did not receive a high school diploma. Additionally, workers in the Midwest who suffered displacement from operator, fabricator, or laborer jobs were less likely to be reemployed in 1986 and 1992.

The characteristics of the displaced job contribute to the determination of reemployment likelihood in the Midwest Census Region. The finality of plant closure increases the chances of reemployment in the Midwest for displaced workers in 1986. Moreover, the likelihood of reemployment in 1986 is enhanced by advanced notification about the impending displacement.

As an economic indicator and a characteristic of the search, high unemployment rates in the state of assessment decrease the 1986, 1988, and 1994 reemployment odds of displaced workers in the Midwest. Additionally, increased population in the state of residence reduces reemployment opportunities in 1992 for displaced workers. Likewise, this is the case for the receipt of unemployment insurance benefits; unemployment benefits tend to lower the likelihood of reemployment for displaced worker in 1988 and 1990. These aforementioned effects are somewhat mitigated by other search characteristics. Displaced workers living in an urban area had an easier time securing a new job in 1992. Also, those displaced workers residing in the Midwest that conducted a post-displacement job-related move increased their reemployment prospects for 1990 and 1994.

Lastly, the temporal subset estimates for the Midwest included binary variables to control for the year of worker displacement. Workers displaced one year prior to the final date for reemployment experienced reduced reemployment odds in all years, except 1990,

when compared to workers displaced three years prior to the final date for reemployment. This indicates that Midwestern workers with less time to search (i.e., workers who are displaced nearer to the year of assessment) will have poorer reemployment opportunities than those workers who have more time to conduct a lengthy job search.¹³

D. South Census Region

For the equations tabulated for the South Census Region (results are summarized in Table 4.5), age lowered the chances of reemployment for the displaced worker in 1988 and 1992. This was offset by marital status; the odds for reemployment in all years except 1986 were enhanced for displaced workers in the South if married. In 1990 and 1994, displaced workers with a high school diploma experienced significantly increased reemployment opportunities relative to those without a high school education. This is also true for displaced workers possessing an undergraduate education; displaced workers in 1986, 1990, and 1992 who attended college for four years fared significantly better than their counterparts who failed to finish high school. Lastly, displaced workers in 1986 and 1988 who attended school beyond the baccalaureate degree had better odds of reemployment than workers who did not complete high school. These results in 1990 were augmented by occupation; workers in the South who suffered displacement from managerial or professional positions were more likely to regain employment in 1990. However, workers displaced from precision production, craft, or repair work had a more difficult time regaining employment in 1988.

¹³ This is a general conclusion. Some of the variables are correct in magnitude and sign, yet statistically insignificant.

The characteristics of the displaced job contribute to the determination of reemployment likelihood in the South. The decisiveness of plant closure increases the chances of reemployment in the South for displaced workers in 1988 and 1992. Moreover, the likelihood of reemployment in 1986 is enhanced by advanced notification about the impending displacement. Reemployment chances in 1994 are reduced for displaced employees who have accumulated many years of tenure at their job of displacement. Also, higher levels of pre-displacement weekly earnings diminish the reemployment opportunities of Southern workers in 1990.

As a search characteristic, unemployment benefits diminish the likelihood of reemployment for displaced worker in all years except 1992. In addition, high unemployment rates in the state of residence decreased the 1986, 1988, and 1992 reemployment prospects of displaced workers in the South. These negative effects are offset by other search characteristics, such as migration and/or urban residence. In 1990, Southern workers dwelling in an urban area secured new jobs more easily. Also, those displaced workers in the South that made a post-displacement job-related move increased their reemployment prospects for 1990. In addition, increased population where the displaced worker lives enhanced reemployment opportunities in 1992 for displaced workers in the South.

The timing of displacement determined the length of time that displaced workers could search for a job. Generally speaking, it appears that displaced workers with more time to search will have better reemployment odds.¹⁴ This is evinced by the binary

¹⁴ This assertion regarding reemployment likelihood in the South cannot be made with complete certainty as some of the coefficients are insignificant.

displacement timing variables. Workers displaced one year prior to displacement assessment have more difficulties gaining reemployment than those workers displaced three years prior to assessment.

E. West Census Region

For the equations tabulated for the West Census Region (results are summarized in Table 4.6), age lowered the chances of reemployment for the displaced worker in 1994. Completion of and schooling beyond a high school education improved reemployment odds. With the exception 1990, Western workers who studied towards/completed a four-year degree enjoyed improved reemployment opportunities when compared to their displaced counterparts who did not graduate from high school. Similar results are realized for high school graduates; high school graduates in the West had better reemployment odds in 1986, 1988, and 1994 than their high school drop-out counterparts. Lastly, displaced workers with graduate school experience had improved reemployment odds in 1994. Furthermore, workers in the West who suffered displacement from precision production, craft, or repair work were more likely to gain reemployment in 1990, but less likely to find reemployment in 1992.

The characteristics of the displaced job contribute to the determination of reemployment likelihood in the West. The decisiveness of plant closure improves the chances of reemployment in the West for displaced workers in 1994. Reemployment chances in 1988 are enhanced for displaced employees who have accumulated many years of tenure at their job of displacement.

Unemployment rates in the state of residence decreased the 1992 reemployment prospects of displaced workers in the West. This is true for the receipt of unemployment insurance benefits which reduce the likelihood of reemployment for displaced worker in 1988 and 1992. Also, Western workers who reside in an urban area had a more difficult time securing a new job in 1994. Additionally, increased population size where one lives diminishes reemployment opportunities in 1992, but increases reemployment odds in 1986 for displaced workers in the West. Lastly, those displaced workers in the West who executed a post-displacement job-related move increased their reemployment prospects for 1986.

Workers displaced one year prior to the final date for reemployment experienced reduced reemployment odds in all years when compared to workers with more time to search (those displaced three years prior to the final date for reemployment). This indicates that Western workers with less time to search (i.e., workers that are displaced nearer to the year of assessment) will have poorer reemployment opportunities than those workers who have more time to conduct a lengthy job-search. This is also true for workers displaced two years prior to 1992. Such workers will have more difficult time securing reemployment in the West by 1992.

The results that have been tabulated in Tables 4.2 through 4.6 will be used in the next section of this analysis. The decomposition technique alluded to earlier and explained subsequently will be applied to the estimates in these region-specific job-search equations. This application will distill differences in reemployment likelihood into portions attributable to regional variation in the characteristics of the worker, the search process,

the timing of displacement, and displaced job characteristics and, alternatively, to reemployment rate differences attributable to regional structural differences.

CHAPTER 5

DECOMPOSING TEMPORAL DIFFERENCES FOR THE NATION AND REGIONS

The estimates in Tables 4.2 through 4.6 can be utilized to decompose regional differences in mean reemployment rates into two effects: one effect that is reflective of displaced worker characteristics or endowments (differences in the explanatory variable means) and the other effect reflective of employer perceptions about displaced worker characteristics or regional structure (differences in estimated explanatory variable parameters). The genesis for this approach is an analysis conducted by Herzog and Schlottmann (1995) which adapts a decomposition technique attributed to Oaxaca (1973) to the issue of job-market outcomes as affected by regional restructuring. The Herzog and Schlottmann methodology is designed to decompose a specific period's reemployment likelihood function into endowment components and structural components.

This study differs from the Oaxaca study (which decomposes wages) and is similar to the Herzog and Schlottmann study in that reemployment likelihood is the target for the decomposition. Also, like the Herzog and Schlottmann study and unlike the Oaxaca study, this analysis uses only the white-male observations. These observations are culled to remove any discrimination effects that might enter the decompositions calculated from parameter differences. Lastly, model parameters are derived from a nonlinear (logit) estimator rather than a linear (OLS) estimator.

This analysis differs from both the Oaxaca study and the Herzog and Schlottmann study in one important aspect. Reemployment likelihoods are decomposed within regions across periods and across regions within a period. With this approach, one is able to develop insights regarding structure in a particular region across time as well as the strength of a region in a particular time period, relative to other regions.

I. Decomposition methodology

The predicted likelihood of reemployment is determined from the logistic equation:

$$L_{mn} = \frac{1}{1 + e^{-T_{mn}}} \quad (4)$$

where

$$T_{mn} = \beta_m' \bar{X}_n \quad (5)$$

In (5), β_m is defined as a vector of parameters on the explanatory variables while $\bar{X}_n$ is a vector of explanatory variable means.¹ These parameters and the means are employed to obtain decomposition results on reemployment rate differentials. There are two sets of reemployment rate differentials which will be decomposed into structural and endowment effects in this study which are:

- 1.) those reemployment rate differentials between regions "m" and "n" for a particular year, and
- 2.) those reemployment rate differentials between years "m" and "n" for a particular region.

¹ These characteristic parameters and means, β_m and $\bar{X}_n$, were calculated in Chapter 4 for the nation and regions by years of assessment. Also, β_n and $\bar{X}_m$, which are needed for the decomposition, were also calculated in the same chapter.

In either case, L_{mn} can be generally interpreted as the likelihood of reemployment for a worker endowed with “n” characteristics who undertakes job-search within a labor market exhibiting “m” structure, where “m” and “n” may be used to designate two distinct regions or two particular years between which the decomposition is conducted.

The difference in predicted likelihood of reemployment between “m” and “n”² can be decomposed into endowment effects, $E_{m,n}$ (differences between “m” and “n” in average worker attributes), and structural effects, $S_{m,n}$ (differences between “m” and “n” in employer perceptions about worker attributes). $S_{m,n}$, or the structural component, can be calculated as $L_{m,m} - L_{n,n}$ and $L_{m,n} - L_{n,n}$.³ The former term represents the change in reemployment likelihood if an average worker in “m” is moved from “m” to “n” to undertake job-search. The latter estimate of $S_{m,n}$ is derived from parameter differentials between “m” and “n” in which the reemployment rate change is based upon the average characteristics that describe “n” workers.

The choice between alternative estimates (above) is typically arbitrary when deriving the endowment and structural effects. These alternative estimates can be explicitly considered within the decomposition by expressing $E_{m,n}$ and $S_{m,n}$ as weighted averages⁴. In this regard,

$$E_{m,n} = w(L_{n,m} - L_{n,n}) + (1-w)(L_{m,m} - L_{m,n}) \quad (6)$$

² The likelihood of reemployment in “m” is $L_{m,m}$ and the likelihood of reemployment in “n” is $L_{n,n}$, hence $L_{m,m} - L_{n,n}$ is the difference in predicted likelihood of reemployment between “m” and “n”.

³ Analogous estimates of $E_{m,n}$ are $L_{n,m} - L_{n,n}$ and $L_{m,m} - L_{m,n}$, respectively.

⁴ The estimation of $L_{m,m} - L_{n,n}$ will not necessarily equal the difference in reemployment rates, $R_m - R_n$, between “m” and “n”. Therefore, estimates of $E_{m,n}$ and $S_{m,n}$ are normalized as $\alpha E_{m,n}$ and $\alpha S_{m,n}$ where $\alpha = (R_m - R_n) / (L_{m,m} - L_{n,n})$. Furthermore, when α takes on a negative value, $S_{m,n}$ and $E_{m,n}$ have little meaning regarding structural or endowment effects and these decompositions will be eliminated from this study in both Sections II, III, and IV.

$$S_{m,n} = w(L_{m,m} - L_{n,m}) + (1-w)(L_{m,n} - L_{n,n}) \quad (7)$$

where “w” ($0 < w < 1$) is the weighting factor. In equations (6) and (7) the proportion of $L_{m,m} - L_{n,n}$, the predicted reemployment rate differential, assigned to $S_{m,n}$ (and conversely to $E_{m,n}$) varies with the value of the weight employed within the decomposition. To avoid decomposition outcomes which are weighted more towards “m” or “n”, this analysis will use a $w = .5$. Later in this investigation (Chapter 6), sensitivity tests will be conducted that employ weights of zero and one, which permit one scrutinize the role of different weights on decomposition outcomes.

The terms “endowment” and “structure” may not provide the best descriptors for what is determined in equations (6) and (7), however these terms are applied in a manner consistent with the interpretation of the Oaxaca (1973) procedure. $E_{m,n}$ and $S_{m,n}$ represent the respective portions of the reemployment rate differential between “n” and “m” attributable to differences in the explanatory variables means and to differences of estimated parameters, respectively. The differences in the estimated parameters, or structural effect, measure the added likelihood of securing reemployment in “m” as opposed to “n” for a representative displaced worker characterized by a given array of attributes.⁵ As noted by Herzog and Schlottmann (1995): “like structural unemployment, this effect measures, at least in part, the degree to which skills required for available jobs match those possessed by displaced workers seeking reemployment. Thus, this term represents a differential capacity (positive or negative) to reemploy additional displaced workers.” (Herzog and Schlottmann, 1995, 566-67).

⁵ These attributes are dependent on the weight, w, in equation (7).

Again, it is worthwhile to note that whether one is using displaced worker reemployment likelihoods to calculate structural differences between regions “m” and “n” for a certain time period or structural differences between time periods “m” and “n” for a specific region, the point of inception is the same. In either decomposition, β_m and β_n (the vectors of parameters on explanatory variables for “m” and “n”) along with $\bar{X}_m$ and $\bar{X}_n$ (the vectors of explanatory variable means for “m” and “n”) must be estimated.

At this juncture in the study, two objectives for investigation arise. This inquiry intends to:

- 1.) replicate the regional structural rankings established by Herzog and Schlottmann for 1992 and expand their analysis of regional structure by repeating this procedure for years 1986, 1988, 1990, and 1994.
- 2.) assess structural change across time for a particular region, using the decomposition methodology.

These two objectives can be met with minimal effort at this point; as stated previously, all of the estimates used to analyze region structure across time can also be used to make interregional comparisons regarding structure.

II. Analysis of structure components between regions

The general equations in (6) and (7) are of an appropriate form for calculating the endowment component and structure component of reemployment rate differential between regions as seen in Herzog and Schlottmann (1995). However, to replicate and expand the results of their analysis, “m” and “n” must be defined. Here, “m” and “n” indicate different United States Census Regions and $E_{m,n}$ and $S_{m,n}$ represent the respective

portions of the reemployment rate differentials attributable to differences in the regional explanatory variable means and of the regional estimated parameters, respectively. The differences in the estimated parameters can be used to rank regions on the relative structural strengths.

Table 5.1 has been organized by the five years of assessment used in this analysis. The decompositions shown in this table were performed assuming a weight of 0.5. Each panel contains the structural components by year of assessment, calculated from reemployment rate differentials among census regions taken from Table 3.2. In these panels, the structural components in each region-row are ranked from 1 to 4 as a measure of regional superiority regarding the reemployment of displaced workers. A ranking of 4 indicates the greatest components in each region-row are ranked from 1 to 4 as a measure of regional superiority regarding the reemployment of displaced workers. A ranking of 4 indicates the greatest structural disadvantage and a ranking of 1 indicates the greatest structural advantage for the four regions included.

Using these rankings, one can assert regional comparisons by considering the rankings within each region-column. The South is consistently ranked first in 1988, 1990, and 1992.⁶ Similarly, the Northeast is ranked third in 1990 and second in 1986 among the four regions sampled. Lastly, the West is clearly ranked second among census regions in 1990.

For other regions, the results are not as straightforward. Still, some of these results can be used to discuss the relative inferiority or superiority of regional structure. In 1988,

⁶ This result corroborates the findings of Herzog and Schlottmann (1995).

Table 5.1

Structural Components of Reemployment Rate Differentials Among Census Regions
(White-males by region of displacement)

1986	Regions:	Northeast		Midwest		South		West	
	Northeast	0	2	*		-9.79	1	*	
	Midwest	*		0	2	-4.88	1	1.88	3
	South	-9.79	2	4.88	4	0	3	-42.91	1
	West	*		-1.88	1	42.91	3	0	2
1988	Regions:	Northeast		Midwest		South		West	
	Northeast	0	1	*		*		*	
	Midwest	*		0	3	-9.89	1	-1.29	2
	South	*		9.89	2	0	1	*	
	West	*		1.29	2	*		0	1
1990	Regions:	Northeast		Midwest		South		West	
	Northeast	0	3	*		-8.52	1	-6.35	2
	Midwest	*		0	3	-14.21	1	-12.41	2
	South	8.52	3	14.21	4	0	1	1.4	2
	West	6.35	3	12.41	4	-1.4	1	0	2
1992	Regions:	Northeast		Midwest		South		West	
	Northeast	0	4	-1.07	3	-10.63	1	-7.29	2
	Midwest	1.07	4	0	3	-9.48	1	-0.96	2
	South	10.63	3	9.48	2	0	1	11.9	4
	West	7.29	4	0.96	3	-11.9	1	0	2
1994	Regions:	Northeast		Midwest		South		West	
	Northeast	0	4	-6.19	3	-7.11	1	-6.99	2
	Midwest	6.19	4	0	2	0.55	3	-1.27	1
	South	7.11	3	-0.55	1	0	2	*	
	West	6.99	3	1.27	2	*		0	1

the Midwest suffered from greater structural impediments to reemployment than the other census regions. Again in 1990, the structure of the Midwest region is ill-equipped to reemploy displaced workers. In 1992 and 1994 this distinction is passed to the Northeast; given the low structural rankings of the Northeast in both these years, it is concluded that the economic structure of other regions surpasses the Northeast in its ability to reemploy displaced workers.

Though the decomposition results in Table 5.1 can be used to assess relative regional strengths for a single period, they cannot be used to discuss temporal regional changes. The decomposition statistics contained in Table 5.1 only analyze structure between regions for one period, hence no opportunity exists for assessing regional structural change across time. Recognizing this, the aforementioned methodology must be modified to accommodate the assessment of temporal structural change.

III. Analysis of structure components over time

The general equations introduced in (6) and (7) can also be used to calculate the endowment component and structure component of reemployment rate differentials between time periods. Unlike in the previous section, "m" and "n" now denote different time periods. Therefore, $E_{m,n}$ and $S_{m,n}$ represent the respective portions of the reemployment rate differentials attributable to temporal differences in the explanatory variable means and the estimated parameters, respectively. The changes in the explanatory variable means can be used to account for the reemployment of displaced workers as their attributes change over time. Likewise, the temporal differences in the estimated

parameters can be used to explain changing perceptions held by employers regarding the reemployment of displaced workers.

One would interpret $E_{m,n}$ and $S_{m,n}$ as those portions of the reemployment rate differential between time periods. Again, $S_{m,n}$ is derived from the differences between estimated parameters and illustrates changing employer's perceptions of worker attributes over time. Negative parameter differences indicate that perceptions about displaced worker attributes are hindering the worker from gaining reemployment as the regional or national economy changes over time. Therefore, the structural effect captured by $S_{m,n}$ illustrates the salable aspect of the skills possessed by displaced workers seeking reemployment, given the changing structure of the region⁷.

Reemployment rates among white male displaced workers seeking full-time employment were listed, according to Census Region, by year for reemployment in Table 3.2. The differences in regional reemployment rates, along with the reemployment rates for the nation, are decomposed into endowment and structural components through application of the aforementioned methodology, generally delineated in equations (6) and (7). The decomposition calculations assumed a weight equal to 0.5.

The results of the decomposition are presented in Table 5.2. This table is divided into five sections with each panel representing the divergent national and regional economies and the respective national or regional ability to reemploy displaced workers as time changes. Table 5.2 summarizes the most general decomposition figures, i.e., the reemployment differential for a particular area is discussed in terms of overall

⁷ Likewise, negative characteristic mean differences indicate that changing worker attributes hinder the displaced worker's chances at reemployment over time.

Table 5.2

Decomposition of Reemployment Likelihood for the nation and Census Region

(White-males displaced between 1984 and 1993 seeking full-time reemployment)

Reemployment rates differentials (by region)	1986-1988	1988-1990	1990-1992	1992-1994
United States				
Difference in Mean Reemployment Rates (%) ^a	6.01	0.72	-11.38	7.22
Portion Attributable to Differences in:				
Average Characteristics (Endowment)	4.64	0.55	-0.88	11.18
Equation Parameters (Structure)	1.37	0.17	-10.50	-3.96
Northeast Census Region				
Difference in Mean Reemployment Rates (%) ^a	8.08	-4.35	-10.05	9.62
Portion Attributable to Differences in:				
Average Characteristics (Endowment)	7.97	-1.17	3.22	20.08
Equation Parameters (Structure)	0.10	-3.18	-13.27	-10.46
Midwest Census Region				
Difference in Mean Reemployment Rates (%) ^a	5.51	-6.46	-3.28	10.12
Portion Attributable to Differences in:				
Average Characteristics (Endowment)	5.15	1.05	0.06	-24.10
Equation Parameters (Structure)	0.37	-7.51	-3.34	34.22
South Census Region				
Difference in Mean Reemployment Rates (%) ^a	3.70	5.56	-12.59	3.66
Portion Attributable to Differences in:				
Average Characteristics (Endowment)	5.64	1.53	-1.13	-5.40
Equation Parameters (Structure)	-1.94	4.03	-11.46	9.06
West Census Region				
Difference in Mean Reemployment Rates (%) ^a	8.37	5.83	-17.32	7.42
Portion Attributable to Differences in:				
Average Characteristics (Endowment)	3.29	20.63	-9.32	8.12
Equation Parameters (Structure)	5.07	-14.80	-8.00	-0.71

^aThe decomposition is based upon the estimations in Tables 4.2 - 4.6 with $w=.5$.

reemployment odds attributed to changing displaced worker endowments and regional structure. In Section IV, these general structural components are dismantled into subcomponent differentials for the nation and by region. These subcomponents provide insights that permit one to pinpoint which aspects of the displacement process, such as personal characteristics or search characteristics, enhance or limit reemployment over time. The decomposition components in Table 5.2 express the change in reemployment likelihood figures attributed to changing national and regional structure and endowment conditions. For example, reemployment prospects for displaced workers improved at the national level, indicated by the positive difference of 6.01% in the mean reemployment rate between 1986 and 1988. These increased displaced worker reemployment odds for 1988 (versus 1986) are primarily bolstered by improved worker attributes at both the national and regional levels. Table 5.2 summarizes the endowment component and how it increases the odds of reemployment at the national level by 4.64%. These attributes include personal characteristics of displaced workers, past experience associated with the displaced job, their ability to search for a new job, and/or the timing of displacement. Also, changing national structure increases the chances of displaced worker reemployment by 1.37% in 1988 when compared to reemployment odds for 1986.

Table 5.2 can also be used to perform similar analysis by region for a particular year. Between 1986 and 1988, reemployment rates improved for all four Census Regions investigated and Table 5.2 shows that regional endowments and structure uniquely explained these changing reemployment rates. In all regions, displaced worker endowments contributed improved reemployment rates between 1986 and 1988

(Northeast $E_{m,n}=7.97$, Midwest $E_{m,n}=5.15$, South $E_{m,n}=5.64$, and West $E_{m,n}=3.29$, all indicating favorable regional endowments). For the Northeast, Midwest, and West, these improved displaced worker reemployment rates attributed to worker endowment are further bolstered by favorable changes in regional structure. Conversely, displaced workers in the South found that any gain in reemployment they experienced because of their endowments was diminished due to the changing regional structure (Northeast $S_{m,n}=.1$, Midwest $S_{m,n}=.37$, and West $S_{m,n}=5.07$ indicating favorably changing regional structure while South $S_{m,n}=-1.94$, indicating unfavorably changing region structure).

Table 5.2 also allows the reader to chart reemployment rate differentials as caused by changing worker endowments. As an example, the changing endowments of displaced workers improve their chances for reemployment if residing in the South Census Region between 1986 to 1990 (1986-88 $E_{m,n}=5.64$, 1988-90 $E_{m,n}=1.53$) After 1990, these opportunities for reemployment shift; the changing endowments of displaced workers dwelling in the South experience decreased odds of reemployment after 1990 (1990-92 $E_{m,n}=-1.13$, 1992-94 $E_{m,n}=-5.4$). Similar endowment trends can be tracked for other regions and the nation.

For the purpose of comparison, these reemployment trends arising from changes in national and regional endowment are summarized in Figure 5.1. These bar graphs are designed to illustrate the favorable or unfavorable impact of changing worker endowments on reemployment likelihood at the regional or national level over time. Figure 5.1 succinctly summarizes the results explained in the previous paragraph, while also providing an abridgment of the favorable and unfavorable impact that changing displaced.

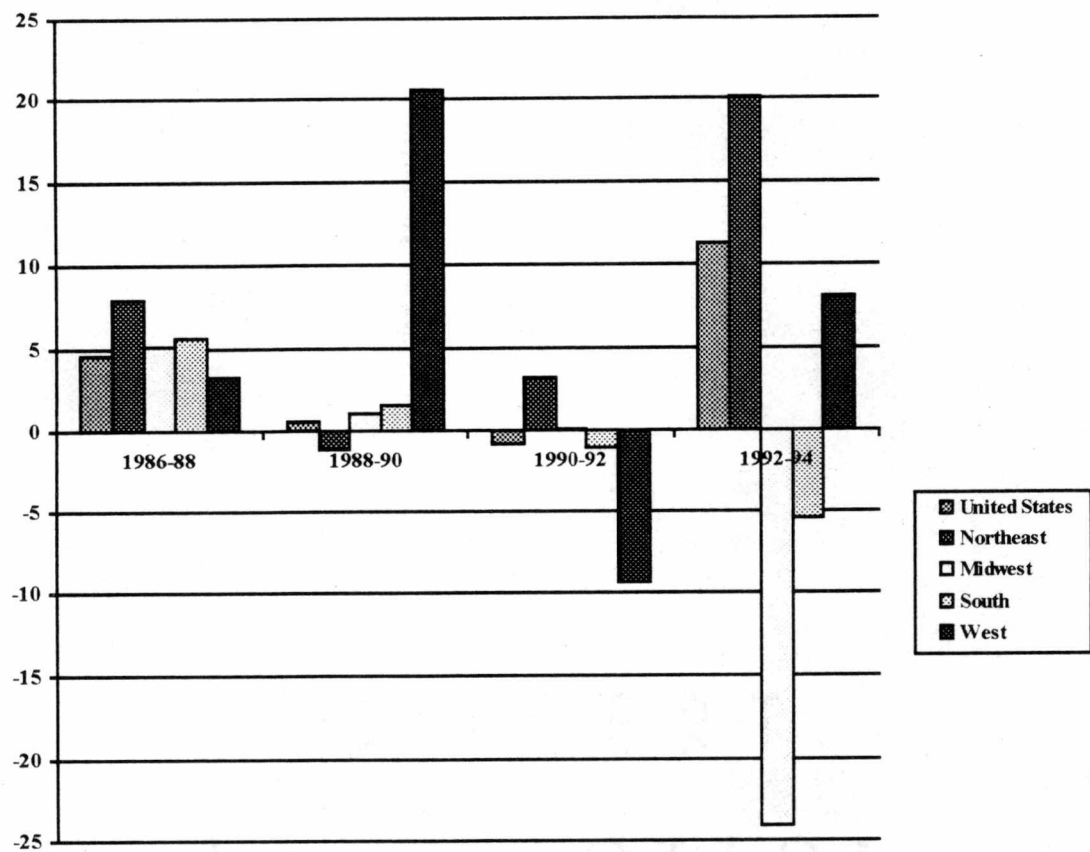


Figure 5.1
Endowment Components (%)
for Census Regions and the Nation

worker endowments have on reemployment in other regions and for the nation

Additionally, the construction of Table 5.2 permits one to track changing regional structure across time. Looking again at the South, the changing perceptions of employers in the South Census Region reduces the odds of reemployment ($S_{m,n} = -1.94$) for displaced workers living in the South between 1986 and 1988. After 1988, structure aided displaced workers in their quest for reemployment over the following two years ($S_{m,n} = 4.03$). This trend ends after 1990; reemployment odds between 1990 and 1992 grow worse ($S_{m,n} = -11.46$), due to the changing structure of the Southern economy. Finally, in 1992 employer perceptions about displaced workers improved ($S_{m,n} = 9.06$) and these workers enjoyed heightened reemployment odds. Similar structure trends can be tracked for other regions and the nation.

For the purpose of comparison, these reemployment trends arising from national and regional structure are summarized in Figure 5.2. These bar graphs are designed to illustrate the favorable or unfavorable impact of regional or national structure on reemployment likelihood between the time periods included in Table 5.2. For example, in the period between 1988 to 1990, the South and the nation as a whole enjoyed enhanced reemployment odds as a result of improving regional structure. Meanwhile, the Midwest, Northeast, and West experienced diminished reemployment odds because of their changing regional structure. These results are quickly discerned by viewing Figure 5.2.

It is important to note the interpretational limitations of this information. While it is possible to use the data summarized in Table 5.2 and Figures 5.1 and 5.2 to discuss improving or worsening reemployment odds over time, one cannot use this information to

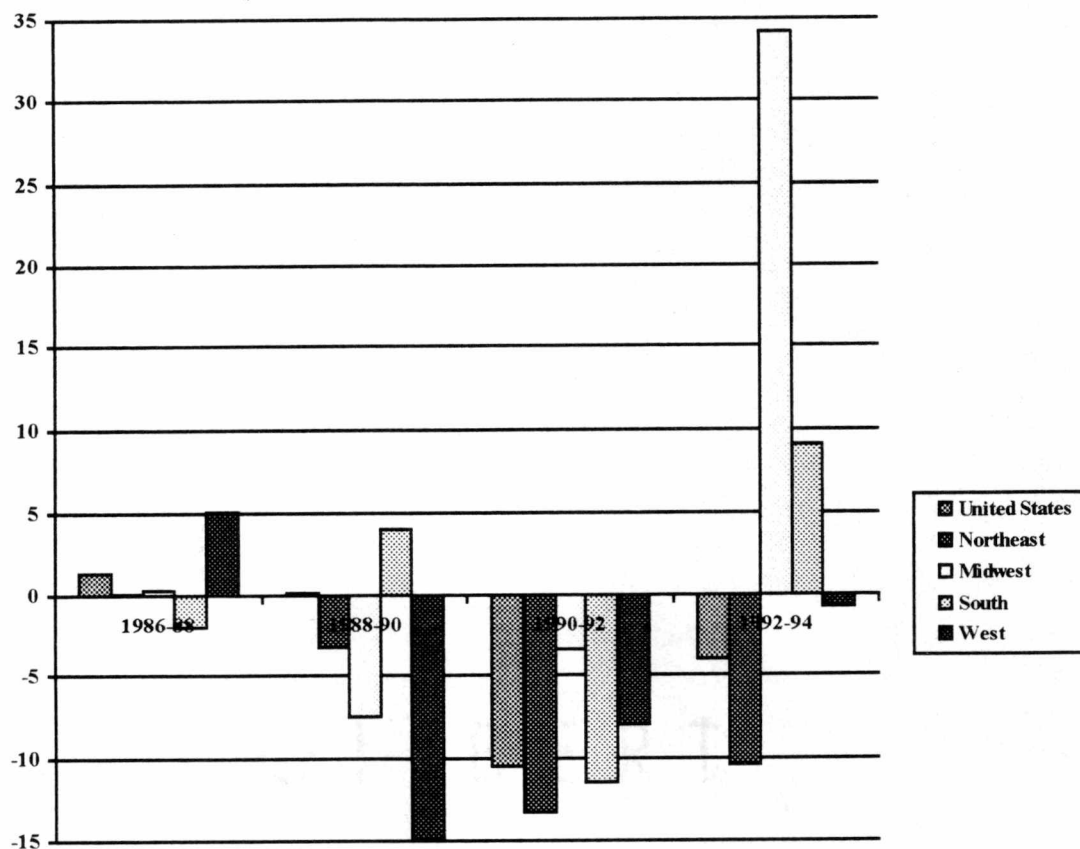


Figure 5.2
Structural Components (%)
for Census Regions and the Nation

make interregional comparisons in a particular time period. However, the information contained in Table 5.1 provides regional rankings by year and these rankings can be used in tandem with the information in Table 5.2 and Figures 5.1 and 5.2 to develop a representation of regional structure as it changes between regions and over time.

IV. Analysis of structure subcomponents over time

The summary of regional structural change developed in Table 5.2 and Figures 5.1 and 5.2 offers sparse information regarding the impact of changing regional structure on displaced worker reemployment. To gain insight as to the root of structural change, reemployment rate differential subcomponents will be calculated based on worker characteristics, displaced job characteristics, search characteristics, and displacement timing. This dismantling enables one to better grasp how the changing structure of regions or the nation aids in the reemployment of displaced workers, based on attributes particular to their displacement situation.

A. Structural subcomponent decomposition methodology

To calculate decomposition subcomponents, reemployment likelihoods must be recalculated. These recalculated reemployment likelihoods will utilize the estimates from Chapter 4, Table 4.2 which were also used in Sections II and III of this chapter. The recalculated reemployment likelihoods reveal those portions of the total structural component fueled by worker characteristics, displaced job characteristics, search characteristics, or displacement timing.

Recall from equations (4) and (5) the original logistic equation for the predicted likelihood of reemployment.⁸ In the spirit of (4) and (5), the new predicted likelihood of reemployment is determined from the logistic equation:

$$L_{mn}^k = \frac{1}{1 + e^{-T_{mn}^k}} \quad (8)$$

where

$$T_{mn}^k = \sum_{i \neq k} \beta_{im} ' \overline{X}_{in} , \quad (9)$$

and β_{im} is a vector of parameters on “i” explanatory variables in “m” while $\overline{X}_{in}$ is a vector of “i” explanatory variable means in “n”. Of the “i” explanatory variables used in this study, the “kth” variable is excluded.⁹ Therefore, L_{mn}^k represents the likelihood of reemployment for a worker, endowed with all but the “kth” average characteristic(s) of “n”, who undertakes job-search within a labor market exhibiting the structure “m”.

These structural subcomponents are concerned with changes in structure across time rather than changes in structure between regions. For this reason, “m” and “n” indicate either the explanatory variable means or explanatory variable parameters for years “m” and “n”

⁸ To restate: the original logistic equation was of the form:

$$L_{mn} = \frac{1}{1 + e^{-T_{mn}}} \quad (4)$$

where

$$T_{mn} = \beta_m ' \overline{X}_n . \quad (5)$$

⁹ The “kth” variable may represent one variable or a group of variables, e.g. displaced job characteristics, for which the parameters have been omitted. This allows one to capture the contribution of a single variable or a series of variables to regional structure.

Using the revised logistic equation in (8), the resulting reemployment likelihoods can be used to assemble structural subcomponents of the reemployment rate differential over time. The resulting decompositions are based on the all but the “kth” variable(s) and are decomposed for a single region into structural effect $S_{m,n}^k$. $S_{m,n}^k$, in terms of reemployment likelihood, is as stated,

$$S_{m,n}^k = w(L_{m,m}^k - L_{n,n}^k) + (1-w)(L_{m,n}^k - L_{n,n}^k) \quad (10)$$

where, again, w ($0 < w < 1$) is the weighting factor.¹⁰ The difference between equations (10) and (7) is the contribution of “kth” variable(s) parameter difference(s) to the total structural effect. To restate,

$$S_{m,n} - S_{m,n}^k = \delta_s^k \quad (11)$$

where δ_s^k is the contribution of the “kth” variable(s) to total structural effect.¹¹ When $\delta_s^k > 0$, parameter “k” improves the structural effects for a region; contrawise, $\delta_s^k < 0$ indicates that the role of “k” regarding reemployment reduces structural effects.¹²

¹⁰ The results for $S_{m,n}^k$ have been normalized in a fashion identical to the results for $S_{m,n}$ calculated from equation (7). See also note 4.

¹¹ The amended reemployment likelihoods (which exclude the “kth” variable) can be used to assemble endowment decompositions. First, the endowment decompositions between “m” and “n” can be calculated as,

$$E_{m,n}^k = w(L_{n,m}^k - L_{n,n}^k) + (1-w)(L_{m,m}^k - L_{m,n}^k)$$

Second, take the difference between the above equation and equation (8) in the main text, or

$$E_{m,n} - E_{m,n}^k = \delta_E^k$$

The difference represents the contribution of the “kth” variable(s) to the total endowment effect.

¹² The sum of all the structural differentials obtained by allowing each variable to be the “kth” variable should, in theory, equal the total structural effect. That is, $\sum_k \delta_s^k = S_{m,n}$. This result, however, is not necessarily the case and the outcomes for δ_s^k must be scaled. The contribution of “kth” variable will be scaled by γ , where $\gamma = \frac{S_{m,n}}{\sum_k \delta_s^k}$. Furthermore, when γ takes on a negative value, δ_s^k has no useful meaning regarding structural subcomponent effects.

B. Structural subcomponent decomposition outcomes

Table 5.3 summarizes the structural subcomponent decomposition outcomes between the years 1986 to 1994 for each census region and for the nation. These outcomes have been assembled by major groupings of attributes particular to the plight of the displaced worker, such as worker characteristics, displaced job characteristics, search characteristics, and displacement timing. This approach is a departure from the more general results tabulated in Table 5.2; the structural subcomponents contained in Table 5.3 illustrate that regional structure may appear to be changing for the better overall, but employer perceptions about certain aspects of regional structure as they pertain to the displaced worker may be unfavorable.

Like Table 5.2, Table 5.3 contains the general effects of national and regional structural change over time; this figure serves as a total for the four structural subcomponents investigated in this section. These structural subcomponents or parameter differences are concerned with:

1. how potential employers evaluate displaced workers experience, education, and skills,
2. how characteristics of the displaced job affect future job prospects of displaced workers,
3. how the conditions of the search affect the outcome of the search for the displaced worker, and
4. how the length of the search affects the outcome of the search for the displaced worker.

Table 5.3
Structural Subcomponents of Reemployment Rate Differentials for the Nation and Census Regions
(White-males displaced between 1984 and 1993)

Region	Portion Attributable to Differences in Equation Parameters on:	1986-1988	1988-1990	1990-1992	1992-1994
United States	Equation intercept	0.54	0.05	-1.66	-3.9
	Worker Characteristics	0.27	0.07	-3.59	2.28
	Displaced Job Characteristics	0.02	0.05	-1.67	0.8
	Search Characteristics	0.30	0.03	-1.85	-0.54
	Displacement Timing	0.24	-0.03	-1.73	-2.59
	Total	1.37	0.17	-10.5	-3.96
Northeast	Equation intercept	0.02	-0.6	-3.28	-2.61
	Worker Characteristics	0.01	-0.54	-3.74	-1.21
	Displaced Job Characteristics	0.05	-0.72	1.52	-1.55
	Search Characteristics	0.01	-0.79	-4.11	-1.52
	Displacement Timing	0.01	-0.53	-3.67	-3.57
	Total	0.10	-3.18	-13.27	-10.46
Midwest	Equation intercept	0.31	-1.57	-0.71	9.13
	Worker Characteristics	-0.90	-1.13	-0.67	33.53
	Displaced Job Characteristics	-0.41	-1.63	-0.68	12.23
	Search Characteristics	0.62	-1.66	-0.62	-1.94
	Displacement Timing	0.75	-1.53	-0.66	-18.73
	Total	0.37	-7.51	-3.34	34.22
South	Equation intercept	*	0.73	-2.04	3.33
	Worker Characteristics	*	1.07	-3.58	4.08
	Displaced Job Characteristics	*	0.62	-1.90	3.33
	Search Characteristics	*	0.67	-1.97	2.13
	Displacement Timing	*	0.91	-1.97	-3.81
	Total	-1.94	4.03	-11.46	9.06
West	Equation intercept	1.16	-2.40	-8.23	*
	Worker Characteristics	1.04	-4.52	-4.54	*
	Displaced Job Characteristics	0.91	0.60	21.71	*
	Search Characteristics	0.89	-7.32	-6.00	*
	Displacement Timing	1.07	-1.15	-10.94	*
	Total	5.07	-14.80	-8.00	-0.71

*Subcomponent estimations cannot be made as the weight, γ , is negative in sign. See note 11.

The estimation of these subcomponents in Table 5.3 permits one to analyze better regional strengths and weaknesses as structure changes across time.

Table 5.3 allows one to chart changing regional structure across time as it is manifested in particular structural subcomponents. Between 1986 and 1988 in the West, employer's evaluation of displaced worker characteristics improved the displaced worker's opportunity for potential employment by 1.04%, due to changing regional structure. However, between 1988 and 1992, changes in regional structure were such that displaced worker characteristics reduce the likelihood of gaining reemployment. Displaced worker reemployment likelihood decreased during this period due to the poor perceptions potential employers have about the skills of displaced worker. Particularly, the changing reemployment odds attributed to employer perceptions about displaced worker skills declined by 4.52% between 1988 and 1990 and by 4.54% between 1990 and 1992. Unfortunately, nothing can be said about potential employer's reactions to displaced workers during the last period in this inquiry.¹³

The results in Table 5.3 also permit the reader to determine what aspect of displacement, i.e., structural subcomponent, fuels the reemployment likelihood of displaced workers. Returning to the West as an example region, the decomposition of changing reemployment likelihoods between 1988 and 1990 indicated that regional structure reduced the likelihood that displaced workers would find reemployment in 1990 versus 1988 by 14.8%. This reduced reemployment likelihood differential is primarily driven by the value that potential employers place on displaced worker characteristics and

¹³ Refer to note 12.

how the conditions of the search affect the outcome of the search for the displaced worker.

This outcome is compounded by how the length of the search affects the outcome of the search for displaced worker in the West; regional structure is such in the West that search time for possible employment further reduces one's reemployment odds. To state these conclusions in terms of reemployment likelihood differentials: changing regional structure causes worker characteristics, search characteristics, and displacement timing to reduce reemployment likelihood by 4.5%, 7.3%, and 1.2%, respectively. These results are mitigated by the displaced job characteristics; the characteristics of the displaced job augment future job prospects of displaced workers in the West by .6%.

The results for the example region can also be contrasted with the nation or to other regions during a single time period. Consider the time span between 1988 to 1990 for both the West and the nation. In the United States overall, changing regional structure improved the likelihood of reemployment for displaced workers during this period by .17%, whereas in the West, changing regional structure reduced reemployment odds by -14.8%. During this period, the rewards to job-search for Western displaced workers seeking reemployment are greatly reduced (-7.32%) and only modestly improve as a result of the search efforts of displaced workers in the nation overall (0.03%). Such divergent results are to be expected in the structural subcomponents, indicating the presence of distinct national and regional structure.

To simplify the analysis contained in the previous paragraphs, Figures 5.3 through 5.6 have been constructed. These bar graphs illustrate changing regional structure as

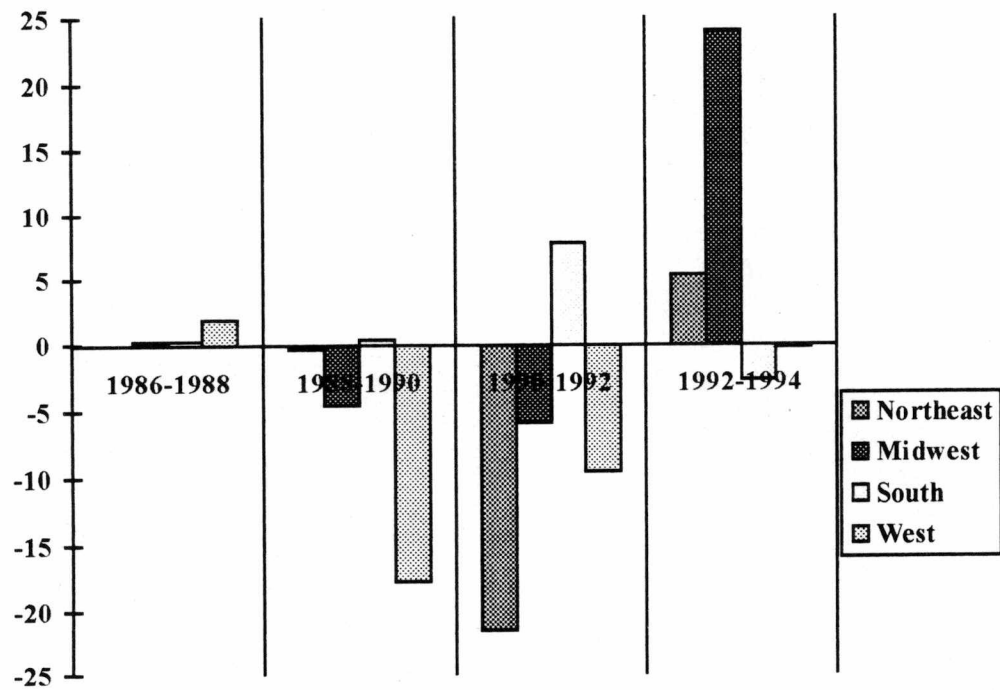


Figure 5.3
Structural effects - Worker characteristics (%)
Reemployment rate differentials by Census Regions

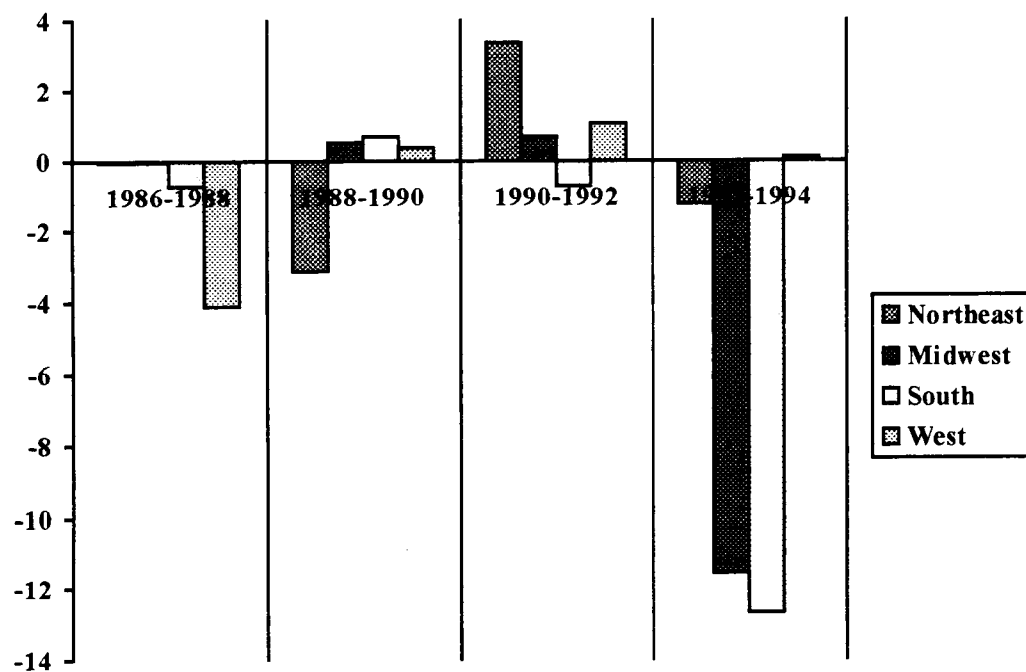


Figure 5.4
Structural effects - Displaced job characteristics (%)
Reemployment rate differentials for Census Regions

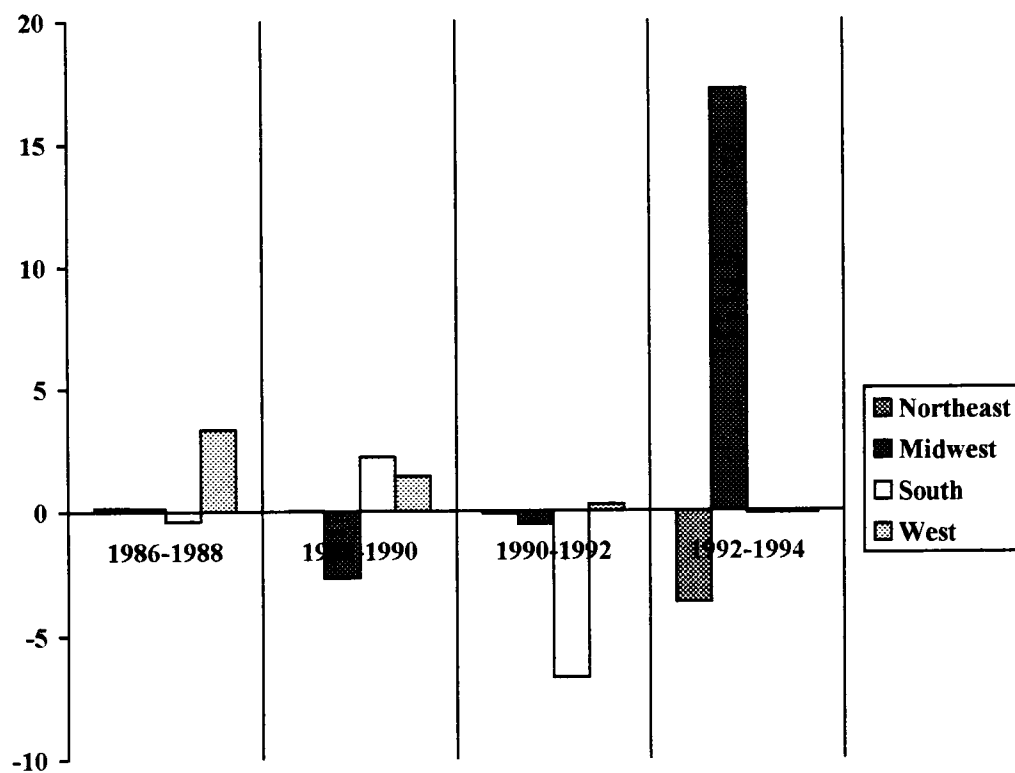


Figure 5.5
Structural effects - Search characteristics (%)
Reemployment rate differentials by Census Regions

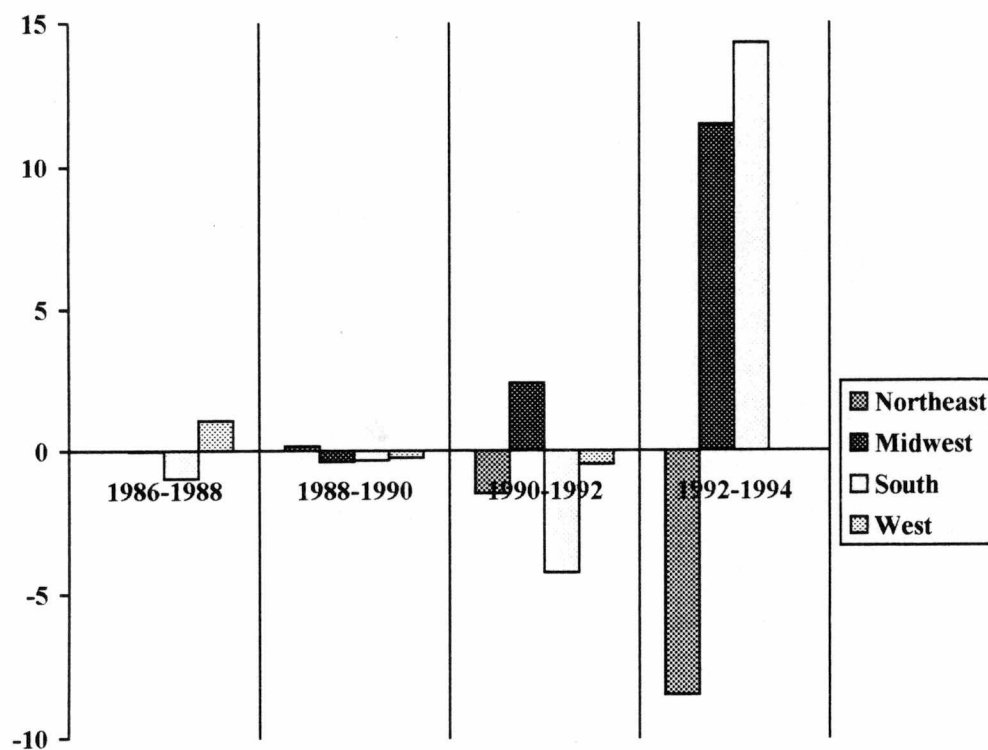


Figure 5.6
Structural effects - Displacement Timing (%)
Reemployment rate differentials by Census Regions

manifested in reemployment rate differentials attributed to employer perceptions about worker characteristics, potential employment opportunity linked to displaced job characteristics, search outcome associated to the aspects of the search, and search outcomes identified with the duration of the search. The bar graphs were created to illustrate the benefit or cost of the aforementioned qualities of displacement on reemployment, as regional structure changes across time. These graphs are designed to illustrate “favorable” or “unfavorable” reemployment odds at the subcomponent level for changing regional structure.

Figure 5.3 shows how changes in regional structure impact the reemployment rate through the perceptions potential employers have about the experience, education, and skills of displaced workers. Between 1986 and 1988, employer perceptions regarding displaced worker characteristics improved the reemployment likelihood of displaced workers in the Northeast. After 1988, the situation for Northeastern displaced workers worsened; they discovered that employers had unfavorable attitudes towards their age, education, and skills. This outcome was duplicated for displaced workers in the West. Western displaced workers also enjoyed improving reemployment odds between 1986 to 1988 and declining reemployment likelihood after 1988 due to the region’s changing value placed on their personal characteristics. Displaced workers in the Midwest experienced poor employer perceptions regarding their personal characteristics for the first three periods investigated. Between 1986 and 1992, displaced workers in the Midwest realized faltering reemployment odds because of employer perceptions about their personal characteristics. This changed after 1992 as Midwestern displaced workers discovered that

potential employers found the personal characteristics of displaced workers to be satisfactory, given the changing structure of the region. Prior to 1990 in the South, displaced workers experienced favorable reactions by potential employers to their experience and education. This positive evaluation of displaced worker characteristics ended in 1990 for workers in the South, diminishing their odds for reemployment. Potential employers in the South, however, reevaluated the characteristics of Southern displaced workers after 1992; changing regional structure in the South resulted in improved reemployment odds for displaced workers.

In Figure 5.4, the impact of displaced job characteristics on future job prospects is assessed. In the Midwest, changing regional structure meant that displaced workers had a harder time securing reemployment between 1986 to 1992 due to the low value that employers placed on the experiences at the job of displacement. During this same period, Western workers enjoyed improved reemployment odds, given employer perceptions about their displaced job experiences. Initially, Northeastern worker underwent improved reemployment odds based on the perceived conditions of their displaced job. This changed after 1988; regional structure was such in the Northeast that displaced workers had limited possibilities for reemployment between 1988 and 1994, attributed to the value employers placed on their displaced job experience. In the South, employer's understanding about aspects of the displaced job improved reemployment possibilities prior to 1990. Between 1990 and 1992, however, they discovered that their displaced job experiences did not improve their worth to employers. However, along with workers in the Midwest, these

workers discovered that the structure of their respective region after 1992 improved their future job prospects, based on their displaced job characteristics.

Changing regional structure, as explained by the characteristics of search for displaced workers, is graphed in Figure 5.5. Between 1986 to 1988, workers in the West, Midwest, and Northeast discovered that the structure of their region improved their chances at reemployment, based on the conditions of their search. Conversely, workers from these same regions found that the conditions of their search reduced their future job prospects between 1988 and 1992. This trend ended in 1992 for workers in the Midwest; regional structure improved future job prospects for these workers because of improved search conditions. Northeastern workers continued to endure poor reemployment odds after 1992 due to the circumstances of their search. After 1988, workers in the South experienced improved odds of reemployment as a result of search conditions, but these favorable conditions subsided in 1990. For the two years after 1990, regional structure in the South reduced possible job options for displaced workers as a result of the search environment. In 1992, this structural trend was reversed and Southern displaced workers discovered that their job prospects were enhanced because of their search conditions.

Figure 5.6 charts the gain or loss linked to search duration in terms of future job prospects. Between 1986 to 1988, the duration of potential search improves reemployment prospects in all regions by virtue of favorable regional structure. After 1988, this trend changed for the Northeast, Midwest, and West; potential search duration reduced the odds of reemployment in these regions. After 1990, the South experienced poor structure concerning potential search duration. This is evidence by diminished

reemployment odds endured the displaced workers in the South during this period. Only displaced workers in the Midwest realized improved reemployment odds attributed to potential search duration after 1992.

CHAPTER 6

SENSITIVITY ANALYSIS OF THE DECOMPOSITION RESULTS

The structural and endowment components tabulated in this study are not immune to changes in the specified weight utilized in the decomposition, redefinition of the data set, or to the respecification of the reemployment equation. In recognition of this, sensitivity analysis was conducted exclusively for the general endowment and structural decompositions across time in Chapter 5, Table 5.2 with respect to the aforementioned amendments to the study¹. These results are summarized in Tables 6.1 through 6.5. These tables contain a restatement of the reemployment likelihood attributed to national and regional endowment and structure components as presented in Table 5.2 and these components will be referred to throughout this chapter as the base decomposition case. The base case calculations are to be used for the purpose of contrast against the amended estimations summarized in Sections I, II, and III in the body of tables 6.1 through 6.5.

One problem in the application of the decomposition methodology lies in the choice of a suitable weight to be used for the calculations. Legitimate weights can range between zero and one. Decompositions thus far have employed a weight of 0.5, which equally favors reemployment at the outset or the end of the displacement time span. For the purpose of the sensitivity analysis, two tests were conducted for each region, each test

¹ The decomposition results contained in Chapter 5, Table 5.1 are also eligible for sensitivity analysis. However, since the primary purpose of this inquiry is to investigate structural change across time by region, sensitivity analysis for the decompositions between regions by time was not conducted.

Table 6.1
Decomposition of Reemployment Rate Differences in the United States
Sensitivity tests for white-males

Test	1986-1988	1988-1990	1990-1992	1992-1994
I. Decomposition Weights				
Weight = 0.0				
Endowment effect	4.46	1.32	0.16	22.99
Structure effect	1.55	-0.60	-11.54	-15.77
Weight = 1.0				
Endowment effect	4.82	-0.23	-1.92	-0.63
Structure effect	1.19	0.95	-9.46	7.85
II. Explanatory variables				
Unemployment unadjusted for displacement				
Endowment effect	5.42	1.57	-4.24	11.16
Structure effect	0.59	-0.85	-7.14	-3.94
Omission of regional variables				
Endowment effect	3.00	-1.18	0.74	13.44
Structure effect	3.01	1.90	-12.12	-6.22
III. Sample Definition				
All Workers				
Endowment effect	4.92	0.10	-0.59	13.24
Structure effect	1.44	0.08	-9.86	-14.12
Total	6.36	0.18	-10.45	-0.88
Base Case				
Endowment effect	4.64	0.55	-0.88	11.18
Structure effect	1.37	0.17	-10.50	-3.96
Total	6.01	0.72	-11.38	7.22

Table 6.2
Decomposition of Reemployment Rate Differences in the Northeast
Sensitivity tests for white-males

Test	1986-1988	1988-1990	1990-1992	1992-1994
I. Decomposition Weights				
Weight = 0.0				
Endowment effect	7.05	-0.88	-1.04	37.84
Structure effect	1.03	-3.47	-9.01	-28.22
Weight = 1.0				
Endowment effect	8.90	-1.46	7.48	2.33
Structure effect	-0.82	-2.89	-17.53	7.29
II. Explanatory variables				
Unemployment unadjusted for displacement				
Endowment effect	9.48	-0.80	-4.20	20.98
Structure effect	-1.40	-3.55	-5.85	-11.36
Omission of regional variables				
Endowment effect	4.73	-1.79	1.64	26.22
Structure effect	3.35	-2.56	-11.69	-16.60
III. Sample Definition				
All Workers				
Endowment effect	17.46	-3.08	3.84	3.37
Structure effect	-9.37	-1.14	-13.58	-3.85
Total	8.09	-4.22	3.84	-0.48
Base Case				
Endowment effect	7.97	-1.17	3.22	20.08
Structure effect	0.10	-3.18	-13.27	-10.46
Total	8.08	-4.35	-10.05	9.62

Table 6.3
Decomposition of Reemployment Rate Differences in the Midwest
Sensitivity tests for white-males

Test	1986-1988	1988-1990	1990-1992	1992-1994
I. Decomposition Weights				
Weight = 0.0				
Endowment effect	6.12	4.95	0.27	-44.47
Structure effect	-0.60	-11.41	-3.55	54.79
Weight = 1.0				
Endowment effect	4.17	-2.84	-0.16	-3.62
Structure effect	1.35	-3.62	-3.12	13.74
II. Explanatory variables				
Unemployment unadjusted for displacement				
Endowment effect	7.45	4.34	-0.47	-23.57
Structure effect	-1.94	-10.80	-2.81	33.69
Omission of regional variables				
Endowment effect	2.23	-3.15	1.44	-23.09
Structure effect	3.28	-3.31	-4.72	33.21
III. Sample Definition				
All Workers				
Endowment effect	4.93	0.53	0.81	-31.91
Structure effect	2.36	-7.13	-3.17	33.97
Total	7.29	-6.60	-2.36	2.06
Base Case				
Endowment effect	5.15	1.05	0.06	-24.10
Structure effect	0.37	-7.51	-3.34	34.22
Total	5.51	-6.46	-3.28	10.12

Table 6.4
Decomposition of Reemployment Rate Differences in the South
Sensitivity tests for white-males

Test	1986-1988	1988-1990	1990-1992	1992-1994
I. Decomposition Weights				
Weight = 0.0				
Endowment effect	5.83	3.08	0.82	-12.98
Structure effect	-2.13	2.48	-13.41	16.64
Weight = 1.0				
Endowment effect	5.46	-0.02	-3.08	2.18
Structure effect	-1.76	5.58	-9.51	1.48
II. Explanatory variables				
Unemployment unadjusted for displacement				
Endowment effect	6.48	3.77	-2.84	-9.67
Structure effect	-2.78	1.79	-9.75	13.31
Omission of regional variables				
Endowment effect	7.32	-0.89	0.11	10.87
Structure effect	-3.62	6.45	-12.70	-7.21
III. Sample Definition				
All Workers				
Endowment effect	3.07	2.32	-1.47	10.84
Structure effect	0.54	2.01	-10.20	-16.46
Total	3.61	4.33	-11.67	-5.62
Base Case				
Endowment effect	5.64	1.53	-1.13	-5.40
Structure effect	-1.94	4.03	-11.46	9.06
Total	3.70	5.56	-12.59	3.66

Table 6.5
Decomposition of Reemployment Rate Differences in the West
Sensitivity tests for white-males

Test	1986-1988	1988-1990	1990-1992	1992-1994
I. Decomposition Weights				
Weight = 0.0				
Endowment effect	1.29	0.72	-9.21	18.00
Structure effect	7.07	5.11	-8.11	-10.58
Weight = 1.0				
Endowment effect	5.30	40.53	-9.43	-1.75
Structure effect	3.06	-34.70	-7.89	9.17
II. Explanatory variables				
Unemployment unadjusted for displacement				
Endowment effect	4.47	29.27	-15.96	7.43
Structure effect	3.89	-23.44	-1.36	-0.01
Omission of regional variables				
Endowment effect	2.56	-10.42	-1.20	9.93
Structure effect	5.80	16.25	-16.12	-2.51
III. Sample Definition				
All Workers				
Endowment effect	3.76	1.26	-4.91	10.86
Structure effect	4.20	3.90	-10.95	-8.52
Total	7.96	5.16	-15.86	2.34
Base Case				
Endowment effect	3.29	20.63	-9.32	8.12
Structure effect	5.07	-14.80	-8.00	-0.71
Total	8.36	5.83	-17.32	7.42

using extreme weight cases: either 0 or 1. When a weight of one is selected, the structural component is defined as the change in reemployment likelihood arising from a worker from period "m" who is seeking reemployment in period "n". Likewise, a selected weight of one results in an endowment component which contrasts the reemployment likelihood of average displaced workers from "m" and "n", both of whom are seeking reemployment in "n". Estimates using a weight of zero can be explained in a similar fashion.²

Using a second set of tests, the base case outcomes were assessed regarding their sensitivity to the inclusion or omission of various state labor market conditions. These state labor market conditions are independent of local labor market conditions, hence it is justifiable to experiment with different specifications of these state labor market variables in the job-search equations. In the first scenario, the unemployment rate, unadjusted for displacement, was used to reestimate the decomposed reemployment rate differentials. The second case was designed to omit all state-level variables, particularly the state unemployment rate and the level of state population. The decomposition results, which are the reestimations of both national and regional job-search equations, omitted or altered state labor market variables and are summarized in Section II of Tables 6.1 through 6.5. These reestimations were conducted with a weight of 0.5.

In the final test, the sample size used in the investigation is redefined. Previously in Chapter 3, reemployment rates were calculated for white-male workers seeking full-

² Further, when a weight of zero is selected, the structure component is the change in reemployment likelihood arising from a worker from period "t-1" who is seeking reemployment in period "t". Additionally, a weight of one results in an endowment component which uses the difference in the reemployment likelihood of average displaced workers from "t" and "t-1", both of whom are seeking reemployment in "t".

time reemployment and these results were used in the decompositions described in Chapter 5, Tables 5.1, 5.2, and 5.3. Additionally, reemployment rates had been calculated for a larger sample which included all white-male workers, regardless of whether or not they sought full-time or part-time reemployment. These reemployment rates for all white-male displaced workers are contained in Table 3.3. Reemployment rate differentials were calculated from this table and then decomposed into structural and endowment effects for each region and the nation using a weight equal to .5. Results of this decomposition are summarized in Section III of Tables 6.1 through 6.5.

I. United States

Reemployment rates for the United States are summarized in Table 6.1, with the base decomposition case repeated in the bottom panel. Section I of Table 6.1 contains decomposition results utilizing decomposition weights of zero and one. First applying a weight equal to zero, national structural conditions increase reemployment to 1.6% in 1988. Again applying a weight equal to zero, reemployment prospects are diminished as time changes between years 1990, 1992, and 1994 with national structural conditions of -.6%, -11.5%, and -15.7%, respectively.

With a weight of one, the decomposition indicates that national structural conditions impede reemployment by 1.2% in 1988 versus 1986, but improve reemployment by .9%, 9.5%, and 7.9% in the two years prior to 1990, 1992, and 1994, respectively. Therefore, excepting 1988, it appears that as the weight approaches one, the structural position of the United States is improved.

Results in Section II of Table 6.1 indicate that the unadjusted unemployment rate increased the calculated structural effect of the United States in 1992 and 1994, with regard to reemployment of the displaced. Reestimates using the unadjusted unemployment rate indicated that the structural position of the United States decreased in 1988 and 1990.

In addition, the omission of state labor market variables results in an increase in calculated structural effects when compared to the base case for periods spanning 1986-88 and 1988-90. Between the years 1992 and 1994 and between 1990 and 1992, the omission of the state labor market variables results in a calculated decrease in the structural component of the United States, relative to the base case for the nation.

Section III presents the decomposition results using the reemployment rate for all displaced workers. Use of the total displaced worker reemployment rate differentials³ reveals a larger structural component differential between 1986 and 1988 along with the years between 1990 and 1992. Contrawise, the reemployment rate for all workers indicates a smaller absolute value for the reemployment rate differential in the two years between 1988 and 1990 as well as between 1992 and 1994.

II. Northeast Census Region

Table 6.2 contains the decompositions resulting from estimates that have been recalculated for the purpose of sensitivity analysis for the Northeast. These decompositions are categorized by the nature of the sensitivity test, as was the case in Table 6.1. Section I of Table 6.2 contains the decompositions calculated using different

³ These reemployment rates for all workers, regardless of full-time status, are listed in Chapter 3, Table 3.2.

weights. With regard to the Northeast, an increase in the weight from zero to one results in decreased structural components for the Northeast prior to 1988 and 1992 and increased the structural effects over the two years preceding 1990 and 1994.

Also, as summarized in Table 6.2, Section II, the results indicate that the unadjusted unemployment rate increased the calculated structural position of the Northeast in 1992, with regard to reemployment of the displaced. Reestimates using the unadjusted unemployment rate indicated that the structural effects of the Northeast decreased in the two years prior to 1986, 1988, and 1994. Also, the omission of state labor market variables results in an increase in calculated structural components in the Northeast when compared to the base case for periods spanning 1986-88, 1988-90, and 1990-1992. Between the years 1992 and 1994, omission of the state labor market variables results in a calculated decrease in the structural conditions of the Northeast, relative to the base case for the region.

Section III of Table 6.2 contains the tabulations for the redefined data set taken from the DWS that includes all white-male displaced workers. For the Northeast, the reestimation of the job-search model and subsequent decomposition reveal that in the two years prior to both 1990 and 1994, the structural component's contribution to reemployment likelihood is of a greater magnitude than the structural component calculated from reemployment figures for white-male displaced workers seeking full-time reemployment. Also, the reestimation using all white-male displaced workers results in a smaller calculated structural component in the Northeast between 1986 to 1988 and 1990 to 1992.

III. Midwest Census Region

In Table 6.3, Section I contains the decompositions reestimates when weights of zero and one are employed with the decomposition methodology. In the Midwest, regional structural conditions increase between 1986 and 1990; as the decomposition weight changes from zero to one, after 1990, the calculated structural effect declines as the weight nears unity. These results, which are calculated with differing reemployment rates, are summarized in Table 6.3, Section I.

Table 6.3 also contains the decomposition results calculated from state labor market variable reestimates for the Midwest. These results indicate that application of the unadjusted unemployment rate in the job-search model decreased the calculated structural results of the Midwest in the two years prior to 1988, 1990 and 1994, with regard to reemployment of the displaced. Reestimates using the unadjusted unemployment rate indicate the structural position of the Midwest increased against the base case results over the two years prior to 1992.

Furthermore, the omission of state labor market variables within the Midwest job-search models results in a increase in calculated structural effects when compared to the base case for periods prior to 1990. For periods after 1990, the omission of the state labor market variables results in a calculated decrease in the structural effects of the Midwest, relative to the base case for the region.

In the Midwest, reestimation using the less restrictive data set that accounts for all displaced workers reveals a larger structural component, relative to the base case, in the two years prior to 1988, 1990, and 1992. The same reestimation shows a relatively

smaller structural component for the Midwest when compared to the base case for the two years prior to 1992.

IV. South Census Region

By allowing the decomposition weight to vary between zero and one, new decomposition results were tabulated which are summarized in Section I of Table 6.4. Structural conditions are shown to increase as the weight approaches one in the years prior 1992 for the South. In the two years after 1992, the increasing weight results in a increasing structural effect for the South.

The results of the state labor market variable reestimates contained in Table 6.4, Section II indicate that the unadjusted unemployment rate increased the calculated structural effects of the South in the time periods after 1990, while decreasing the structural conditions of the South in the years previous to 1990, with regard to reemployment of the displaced.

Also summarized in Section II of this table, the omission of state labor market variables within the job-search models for the South reveal a decrease in calculated structural effects when compared to the base case for periods spanning 1986-88, 1990-92 and 1992-1994. As time changed between the years 1988 and 1990, omission of the state labor market variables resulted in a calculated increased change in the structural state of the South, relative to the base case for the region.

The estimates obtained from using all white-male displaced workers as a sample indicate a structural position of a greater magnitude in the South between years 1986 to 1988 and 1990 to 1992. In contrast, the recalculated structural conditions, when

compared to the base case, is shown to be smaller in magnitude for the South over the two years prior to 1990 and 1994.

V. West Census Region

Section I of Table 6.5 contains results obtained by increasing the decomposition weight from zero to one. By selecting weights that approach unity, the resulting decomposition result indicates a decrease in structural components in two year intervals between 1986 and 1990 in the West. After 1990, increases in the applied weight increase the calculated structural components of the West.

Table 6.5, Section II contains state labor market variable reestimates. The results of the tabled calculations indicate that the unadjusted unemployment rate decreased the calculated structural position of the West in the two-year periods prior to 1988, 1990, and 1994, with regard to reemployment of the displaced. Reestimates using the unadjusted unemployment rate indicated that the structural state of the West increased against the base case results over the two years prior to 1992.

Furthermore, the omission of state labor market variables within the West Census Region job-search models resulted in an increase in calculated structural effects when compared to the base case for periods prior to 1990. Contrawise, the exclusion of state labor market variables reduce the reemployment contribution attributed to the structural component in the periods after 1990.

When considering the West, reestimation of the job-search model using data assembled from the broader definition of displaced worker and subsequent decomposition shows that the structural component's contribution to reemployment likelihood is

absolutely smaller in value for the two year periods prior to 1992. Also, the reestimation using all white-male reemployment figures is larger in magnitude than the base decomposition case for the West in the period between 1988 to 1990.

In review of these sensitivity results, the possibility of discerning general or overall patterns were sought. Comparisons were made between structural decomposition results by category, i.e., decomposition weight or sample definition, as well as contrasts between sensitivity results and the base case. Unfortunately, such investigations yielded no identifiable patterns. Evidently, the changing weights, omission of variables, and sample redefinition create results that cannot be explained by simply observing and developing trends for structural component outcomes contained here.

CHAPTER 7

CONCLUSION

The existing methodologies for assessing regional structural change are limited at present. Regional structural change can be assessed using gross regional product (GRP) figures to tabulate rate changes in GRP and changing shares of GRP by major industry sector. Regional structural change can also be assessed through the use of shift-share analysis, in which calculations of regional figures illustrate the competitive position of a region as well as the industry mix possessed by that region. Further, regional input-output analysis provides detailed information about structural change by examining interindustry transactions and investigating the distribution of output throughout the national or a regional economy.

However, with regard to answering questions about the impact of regional structure on labor markets, accounts provide little or no relevant information. While GRP can be used to discuss regional structure in terms of output, they do not establish a clear link between regional structure and the reemployment of the structurally unemployed or displaced. Furthermore, the structural component calculated in shift-share analysis is corrupted by amalgamation of growth and regional structure components to the point that the share effect, the industry mix, and the competitive effect are all intertwined, with little information provided regarding structural change. Lastly, input-output estimates would be ideal for discussing the impact of regional structural change on labor markets, assuming

the data exists. Input-output analysis "shows in detail the sources of demand for goods and services produced in the region under study, and it shows in similar industrial detail where imports come from and the destination of exports" (Miernyck, 1965, 65).

However, regional input-output figures are difficult to calculate accurately, given the dearth of data available for regions and time periods of interest. Therefore, input-output analysis is an unrealistic methodology for assessing the impact of changing structure on labor markets.

This analysis provides an alternative means of assessing regional structural change and avoids the problems inherent in shift-share analysis, input-output studies, and accounts. This methodology sidesteps the major shortcomings of these aforementioned assessment tools by eliminating the need for detailed regional data, which is virtually nonexistent, and permitting regional structural estimates to vary independent of some predetermined reference economy. Instead, this method of assessment utilizes the characteristics of those displaced workers who have lost their jobs due to plant closure, shift elimination, or slack work. Throughout this investigation, it was noted that displaced workers are a special class of the unemployed. Their distinction as a unique class of labor lies in the fact that these workers were casualties of structural change within a particular region or the nation. Therefore, as a class of labor, they experience the same labor circumstances that affect those who have been structurally unemployed. It is for this reason that the labor market outcomes of displaced workers can yield insight as to the temporal structural changes taking place at the national and regional level.

The labor market outcomes of these displaced workers are broadly contingent on those characteristics associated with the worker (mean explanatory characteristics), and upon regional attributes associated with structure (estimated explanatory variable parameters). The characteristics that define the displaced worker can be divided into four categories, including attributes of the worker, characteristics of the displaced job, characteristics of the displaced workers' search, and the timing of displacement. These characteristics can be controlled for in a conventional job-search model that is designed to describe the reemployment of displaced workers. The assessment of regional structure, however, is not explicitly estimated in the job-search equations. Instead of attempting to control within the model the many elements that contribute to regional structure, a decomposition technique is employed. The latter is designed to separate changing reemployment likelihoods into two components, one that is attributed to worker characteristics and one that is ascribed to regional structure components. These components are defined as the "endowment component" (for changing worker/displaced job/search/timing characteristic means) and the "structural component" (for changing equation parameters), with the latter providing information regarding how potential employers differentially evaluate displacement characteristics over time.

Using the estimated job-search equations, this decomposition methodology was applied to both temporal and interregional reemployment rate differentials. These decompositions produced two sets of structural components, one that assessed relative regional structural strengths during a given period and the other that evaluated regional structural change over time.

The structural components calculated from interregional reemployment rate differentials were used to establish a ranking of regions by period, based on relative regional structural strength. Using these rankings, one is able to make regional comparisons within a time period. The South is consistently ranked first in 1988, 1990, and 1992 while the Northeast is ranked third in 1990 and second in 1986 among the four regions sampled. The West is clearly ranked second among census regions in 1990. The other regions fail to yield such straightforward rankings, although some of these results can be used to discuss the relative inferiority or superiority of regional structure. In 1988, the Midwest demonstrated poorer regional structure than the other census regions. In 1990, Midwestern employers fail to place value on displaced workers, relative to the rest of the nation. In 1992 and 1994 this distinction is passed to the Northeast; regional structure results in unfavorable employer perceptions about displaced workers in the Northeast.

The structural components calculated from temporal reemployment rate differentials were used to develop a chronicle of regional structural change over time by region. Except for the South, the results of this decomposition technique revealed that the nation and all other regions improved structurally during the two years prior to 1988. During the next two years, the structure of the nation as a whole continued to improve as measured by its ability to reemploy displaced workers. At the regional level the outcomes changed for every region. Those that underwent improved structure between 1986 and 1988 endured a deterioration in structure over the following two years, and vice versa. In the following two-year period, all regions and the nation experienced a structural setback

as manifested in each area's ability to reemploy displaced workers. This trend was reversed somewhat during the final two-year span analyzed; the South and the Midwest regions improved structurally from 1992 to 1994. Still, the continued structural decline of the Northeast and the West overpowered the structural improvements realized elsewhere, causing structural change to decline for the nation overall.

Together, the structural components from the interregional decomposition and the temporal decomposition provide valuable insights that can be utilized by policy makers. When applied concurrently, the two sets of explanatory variable parameter differences permit one to assess regional structure across space and over time.

For example, consider the structural position of four census regions between 1990 and 1992. During this period, employer's perceptions of displaced worker characteristics worsened in all regions, i.e., changes in regional structure reduced the reemployment likelihood of displaced workers between 1990 and 1992. These temporal structural components indicate that government assistance should be made available to displaced workers in each region. Of the four regions in question, it would be desirable to know which region had experienced the greatest structural setback and would thus need the greatest amount of government assistance. However, if this public policy is designed using only the temporal structural components, nothing can be said with regard to which region is faring the worst. This limitation is overcome if the interregional structural components are applied alongside temporal structural components.

The interregional structural components conclusively indicate that the South has the best structure in both 1990 and 1992, relative to the other census regions examined in

this inquiry. Also, these interregional structural components indicate that the West followed the South in relative structural strength in both 1990 and 1992. Lastly, the interregional structural components for the Midwest and Northeast suggest that these two regions have fared the worst in terms of relative structure. It is important to note that, like the temporal structural components, the interregional structural components offer little to the policy maker when used in isolation. While these results indicate that the South is the “best” and the Midwest and Northeast are the “worst” in terms of their ability to reemploy displaced workers, the results say nothing about improving or declining regional structure over time. To use only these rankings, one might be tempted to offer all government assistance to the Midwest and Northeast, some to the West, and none to the South since it is structurally superior, relative to the other regions.

When both sets of decompositions are applied jointly, the policy recommendations are clear. First, all regions need assistance because of the increasingly poor perceptions that employers have regarding displaced worker characteristics, i.e., the decline in structure in all regions between 1990 and 1992. Second, structural impediments to the reemployment of displaced workers are greater in the Midwest and Northeast during 1990 and 1992. Thus, Midwest and Northeast need more government assistance than the West and the South.

These temporal and interregional structural components provide general policy information by indicating which regions need assistance. However, these general structural components provide no information on how such aid should be apportioned. Government assistance should be designed to target those displacement characteristics

that are neglected or undervalued by regional employers. Again using the estimates of the job-search equations, the decomposition methodology was applied to temporal reemployment rate differentials with regard to worker characteristics, displaced job characteristics, search characteristics, and displacement time. The resulting temporal structural subcomponents are useful for analyzing changing employer perceptions about specific displacement attributes for policy purposes.

Consider again the years between 1990 to 1992. Application of the general temporal and interregional structural components indicated a need for displaced worker assistance in all regions, with a greater emphasis in aid on the Northeast and Midwest. Application of the structural subcomponents indicates that

1. Midwestern employers have poor perceptions about all displacement attributes, i.e., worker characteristics, displaced job characteristics, search characteristics, and displacement timing.
2. Northeastern employers have poor perceptions about worker characteristics, search characteristics, and displacement timing.

Therefore, the temporal structural subcomponents indicate that similar, but different, policy prescriptions should be designed for the Northeast and Midwest.

Between 1990 to 1992, the structure of the Midwest and Northeast is such that potential employers place a reduced value on the experience and education of displaced workers. Given this diminished value for displaced worker skills, a portion of the recommended government aid could be allocated to retraining and education programs in both the Northeast and the Midwest.

Also during this two year span, the Midwest and the Northeast differ structurally in one respect. In the Northeast, the characteristics of the displaced job improve future job prospects, whereas in the Midwest, displaced job characteristics reduce future job prospects. These results indicate that no assistance is needed in the Northeast with regard to displaced job characteristics; inaction yields the best results as displaced job characteristics bolster future job prospects in the Northeast. In the Midwest, however, policy should be designed to augment future job prospects through displaced job characteristics, e.g., regional policy makers in the Midwest could legislate measures to ensure the communication of advanced notice of plant closure.

Again, the methodology employed in this analysis offers an alternative measure of national or regional health that can be easily derived from reemployment rate differentials and displacement characteristics. The aforementioned two-year example for all regions is not the only situation about which policy recommendations can be made from the estimated interregional and temporal structural components and temporal structural subcomponents. Reemployment rate decompositions are suitable for developing regional policy in all years and regions assessed in this study, which are used to recommend policy action or inaction.

Initially, one can use the general structural decomposition figures to discuss changing regional or national structure as it impacts the reemployment potential of displaced workers. Policy makers can then employ these figures to discuss the structure of the region and label it as "improving" or "declining" in terms of the changing reemployment likelihood of displaced workers.

Furthermore, structural subcomponents can be used to pinpoint what aspects of displacement contribute to reemployment, given the structure of the region or nation. The structural subcomponents indicate trends that may not manifest themselves in the more general decomposition results. By charting these subcomponents over time, one can see how regional structure reacts to the different attributes of displacement. Policy makers can then use these results to analyze both improving and declining regions, based upon how these aspects of displacement better or reduce reemployment likelihood across time. Regardless of whether the overall regional structure is changing for the better or the worse, the government can determine which displacement characteristics contribute most to continued unemployment and remedy the situation. This allows policy makers to tailor and target procedures at the regional level that are the most effective in reducing structural impediments to the reemployment of displaced workers.

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