Is Migration a Solution to the Earnings Loss of the Displaced Workers in the Segmented Labor Market in the U.S.?

by

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(Abstract)

Earnings loss due to both lower wages at the current job and the time forgone between two jobs is one of the major consequences of job displacement caused by plant closing, moving and downsizing in the 1980s. Is migration a solution? The present study attempts to answer this question empirically by exploring five waves of data on the displaced manufacturing workers from the CPS Displaced Workers Supplements.

Human capital theory and neo-classical theory of labor migration both assert that migration should improve people's socio-economic status. They largely neglect social and economic structural constraints on the outcomes of individual behavior. From the dynamic segmentation perspective, this study hypothesizes that deindustrialization has been squeezing workers from the subordinate (lower-tier) primary segment down and thus such workers suffered more loss than their counterparts from the independent (upper-tier) segment; since deindustrialization primarily affected the core manufacturing industries, core workers suffered greater

ABSTRACT
loss from displacement relative to their peripheral counterparts. In this context, this study further hypothesizes that migration will not benefit the workers from the subordinate primary segment as much as the workers from the independent primary segments.

The empirical results confirm the main hypotheses of the present study: Workers displaced from the subordinate primary segment suffered more earnings loss and longer jobless duration than their counterparts from the independent primary segment. Workers from the core industries experienced longer jobless duration than their counterparts from the peripheral segment. Migration had no effect on the post-displacement earnings and jobless duration for the displaced workers from either segment. The clear implication of these findings is that migration is no solution.

Among other things, occupation/industry change when reemployed is an important factor causing earnings loss; formal educational attainment reduces earnings loss and shortens the jobless duration while work tenure on the pre-displacement job increases earnings loss and lengthens the jobless duration.
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Last but not least, I would like to express my profound gratitude to my beloved wife, Helen, for her understanding of and patience with this lengthy process as well as for her editorial help with the construction of tables and references of this dissertation.

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CHAPTER I

INTRODUCTION

There is a good deal of evidence that for the past two decades the economy of the United States has been shifting away from the manufacturing industries to high-technology and service industries. This shift is conceptualized by Bluestone and Harrison as deindustrialization—a process of "Wide spread, systematic disinvestment in the nation's productive capacity" (1982:6). In conjunction with this shift were the loss of relatively high-paying manufacturing jobs and the rise of jobs in the service sectors, in which both skills and pay are being bipolarized. As a consequence, displacement of workers from the declining manufacturing industries and resultant economic losses due to either lower current wages relative to the previous ones or time lost between two jobs were common scenes during the 1970s and 1980s. Numerous researchers have documented this deindustrialization process and subsequent losses from displacement for individuals as well as for communities. Is migration a solution? With data from the Current Population Survey Displaced Workers Supplements, January 1984, 1986, 1988, 1990 and 1992, the current study

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The data utilized in this dissertation were made available by the Inter-university Consortium for Political and Social Research (ICPSR). The data for CURRENT POPULATION SURVEYS, JANUARY 1984, JANUARY 1986, JANUARY 1988, JANUARY 1990, AND JANUARY 1992: DISPLACED WORKERS were originally collected by The United States Department of Commerce, Bureau of the Census. Neither the collectors of the original data nor the Consortium bears any responsibility for the analyses or interpretations presented in this dissertation.

I. INTRODUCTION
attempts to find empirical evidence to answer the question of whether or not migration is a solution to such earnings loss for the displaced manufacturing workers.

I.1. How Big Is the Problem?

There are some arguments regarding the extent of the deindustrialization and economic restructuring in the United States. In the spatial dimension, for instance, there was a belief that the decline of durable goods manufacturing industries occurred only in the Northeast "snowbelt" and Midwest "frostbelt", or so-called "rustbelt". The plants were first shut down in those regions and capital fled from those regions to the south regions for better business climate. Thus, it was only regarded as a regional problem since while "frostbelt" and "rustbelt" regions were declining the southwest "sunbelt" was booming. In the dimension of depth, the past belief was that only those large firms in engineering-based manufacturing industries were contracting due to the downturn of the business cycles. However, these two beliefs are too simplistic and became obsolete facing the reality of the past two decades because they overlooked the permanent structural changes of American economy associated with the technological innovation and redivision of labor in the world economy. In the spatial dimension of the problem, according to Wallace and Rothschild (1988:4), over 5 million businesses closed their doors between 1981 and 1985 nationwide, surprisingly with the hardest hit regions in the south; and in the dimension of business size of those plants that closed down, many of them were very small businesses, which were

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altogether responsible for over 11.5 million dislocated workers. And in the dimension of depth, Bluestone and Harrison (1982:53) note:

...no one appears to be immune to job loss no matter how well placed. Popular conceptions notwithstanding, displacement respects neither educational attainment nor occupational status. There is virtually no difference in educational background between those displaced and total population at risk. Similarly, there were no substantial differences among professionals, clerical workers, operators, and services workers in the chances of being displaced. In the words of these Ohio State researchers: "Apparently the risk of displacement from a job after reasonably long tenure is insensitive to conventional measures of human capital and to the particular occupations in which men are employed." When a plant shuts down, or operations are permanently curtailed so that some workers receive layoffs without recall, engineers lose their jobs along with janitors.

1.2. Evidence of Consequences on Displaced Workers

Evidence from the national sample surveys (Flaim and Sehgal 1985; Horvath 1987; Herz 1990; 1991) support the above arguments about the deindustrialization in terms of its deep and wide coverage of victims. A comparison among the four displaced workers surveys by Herz (1991:1) suggests that although few in number, the workers displaced in the late 1980s represented a wider range of industries and occupations than did those displaced earlier in the decade. During the first two survey periods (1979-83 and 1981-85), both of which included the 1981-82 recession, nearly 50 percent of the displaced workers had lost factory jobs. That proportion declined to 38 percent during the most recent period (1985-89), although factory workers were still overrepresented. The major consequences of displacement are the lengthy duration of unemployment, downward mobility in occupation and earnings. The
Current Population Survey Displaced Workers Supplements (CPSDWS) show the
mean weeks without work following displacement for those workers who were
reemployed by the survey time were approximately 25.3, 25.1, 16.1, 14.2 and 14.5
weeks, respectively. Evidence from the same surveys indicates that roughly one-half
of the displaced workers changed their occupations when reemployed fulltime and
about the same proportion also changed their industries; 49%, 47%, 44%, 47% and
51% of the reemployed workers, in respective surveys, earned less at the survey time
than they did at the previous jobs they lost. By the survey time, of those who
remained in the labor force, 16%, 13%, 10%, 10% and 19% were still unemployed
and looking for a job. According to Harrington and Levinson (1985:421), the 1984
CPS data, for instance, show that in January 1984, 60.1% of the displaced workers
had found other jobs, 25.5% were still unemployed, and 14.4% had left the labor
force. Those who found new jobs had often been subjected to the "sliding"
phenomenon in their wages. The loss of income affected about 59% of the more than
5 million workers whose jobs had disappeared.

\[2\] Obviously there is a declining trend in unemployment duration following
displacement and a rising trend in reemployment rate over the last decade, which
reflect both overall improvements in national economic conditions and the timing of
individual survey periods (see Herz 1991). However, the last survey (January 1992)
shows a rise in jobless duration, indicating another cyclical downturn of the economy.

In addition, evidence suggests that workers displaced from the manufacturing
industries experienced longer weeks without work following displacement than did the
displaced workers as a whole.

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Such an overall picture of displaced workers may not tell us much about who is more likely to be included in the above categories of displaced workers. In other words, who suffered loss and who did not? And, who suffered more and who suffered less? The January 1984 CPS Displaced Workers Supplement (Flaim and Sehgal 1985:10) indicates that nearly 2.5 million, or almost one-half of the total number of displaced workers for the 1979-84 period, had lost jobs in manufacturing, an industry sector that now accounts for less than one-fifth of total employment. They also are more likely to change their occupations when reemployed. Of the workers who did find new full-time jobs, furthermore, those displaced from goods-producing industries suffered the greatest earnings loss. Within manufacturing, workers who lost jobs in transportation equipment, in particular, auto manufacturing industry, had the most difficult time (Herz 1991:5). A review of previous literature by Flaim and Sehgal (1985:12) indicates that older workers and workers with less education and long tenure, displaced from well-paying unionized industries tended to have suffered more earnings losses.

I.3. The Labor Market Consequences of Deindustrialization

Plant closings and movings seemed to hit everybody in an organization equally when they occurred. However, the above evidence may well indicate that the subsequent losses suffered varied among the displaced workers according to the conditions of labor market sectors which are relevant to previous industry and

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occupation of individual displaced workers. That is, workers displaced from the declining industries and occupations with obsolete or job/industry specific skills tend to have suffered more. Thus the characteristics of workers "ascribed" from previous occupation and industry are not without importance to workers for their opportunities after displacement because in the external labor markets the displaced workers would be reevaluated in terms of their potential contribution to the individual organizations. In other words, who suffered more and who suffered less largely depends on the labor market conditions for the specific sectors to which the workers belong, because if the demand for labor in their corresponding sector was declining, their value would be depreciated.

Since the labor market conditions are so important, what then has the deindustrialization done to the American job market? According to Harrison and Blasin (1988:112), the absolute number of jobs that the American job machine has created in the mid-1980s makes people optimistic and makes other developed societies which are experiencing a similar deindustrialization process envious. But when we take a closer look at the kind of jobs created compared to the jobs lost, it is not too hard to find that the majority of jobs created were in the service sector whereas the majority of jobs lost were in the manufacturing sector (The Economist 1986; Moore 1989; Harrison and Bluestone 1988; Plunkert 1990; Haugen 1986; Shank and Haugen 1987; Silvestri and Lukasiewicz 1987; Harrington and Levinson 1985). As Plunkert (1990:3) observed, "Although employment grew by nearly 19 million jobs, its

I. INTRODUCTION
strength was uneven; three-fourths of the increase was in services and retail trade, while manufacturing and mining lost workers." Projections of occupations between 1982-1995 indicate that the largest job growth is led by building custodians, followed by cashiers, secretaries, general clerks, salesclerks, registered nurses, waiters and waitresses (Harrington and Levinson 1985:422). Harrington and Levinson (1985:417) commented that "...even if those growth rates are achieved, the changing American occupational structure is becoming bifurcated, and this may create serious difficulties for many working people, as well as for American business." According to Bluestone and Harrison (1982:95), a new "dual economy" is generated:

... On the one hand, high-tech developments are creating some relatively high wage jobs (many of which are taken by well-educated immigrants to the areas). On the other, large number of low-wage jobs are being generated in the retail trade and service sectors of the economy. Moreover, the impact of technological and organizational changes in manufacturing and services seems to have tended to eliminate (or downgrade) those jobs that fall in the middle of the skill (and wage) spectrum.

More importantly, the allegedly promising high-tech industries only added 2% of the 19 million jobs created during the 1969-1979 (Harrington and Levinson 1985:424).

Another important aspect in job creation that should be taken into account is the flexibility strategies in hiring practices in the external labor markets adopted by firms in response to the unpredictable fluctuations in the commodity market, which include the conversion of full-time positions into part-time positions, and year-round positions into temporary positions. These strategies further turned workers into

I. INTRODUCTION
marginal status with limited bargaining power and result in workers’ "structural underemployment" or "contingent employment"—"jobs that provide few benefits and no promised employment security" (Block 1990:109). Correspondingly, evidence from various data sources (Haugen 1986; Nardone 1986; Mellor and Haugen 1986) indicates large numbers of workers involuntarily entered the status of long-term part-time employment after displacement. In short, temporary and part-time jobs are becoming permanent phenomena of the American labor market.

I.4. Conceptualizing Displacement

From the above discussion, we may find that people who lost jobs due to deindustrialization have some common characteristics, which distinguish them from the unemployed in the everyday sense: First of all, they lost their jobs involuntarily because of plant closure, plant relocation, severely curtailed operations (abolishment of shifts or positions). Second, they had invested a considerable amount of their working life into the jobs from which they were displaced and/or had acquired considerable amount of job-specific skills, which are very unlikely to be transferable to other jobs. The majority of them do not have any other marketable skills and thus are unprepared for any other jobs. Third, related to the second characteristic, most of them were relatively well-paid at the lost jobs and enjoyed quite decent fringe benefits and thus regarded themselves as middle class. In short, displacement refers to the status of being dislocated from the jobs, into which the workers have invested much

I. INTRODUCTION
time and from which they have received relatively decent income and benefits; they were dislocated not because of their own fault but because of plant closing/relocation or operation curtailment. Thus, using the data collected in the supplements to the Current Population Survey in January 1984, the Bureau of Labor Statistics operationally defined displaced workers as those adults who, after holding a job for 3 years or more, lost or left that job because of plant shut-down or relocation, slack work, or abolition of shift or job. In comparison, unemployment is a general term depicting the status of workers without jobs for any reasons.

1.5. "Is Migration a Solution?"

Facing such a turbulence of the American economy, Bluestone and Harrison (1982:99) raised the question: "Is migration a solution?" From a conventional cost/efficiency perspective, however, their answer is "No", because of high social and individual cost both for the declining area and displaced workers. To a large extent, Bluestone and Harrison are correct in terms of high cost incurred by migration to the individual workers as hypothesized by Clark and Whiteman's (1983) analogy of "poortown" and "richtown". They believe that the majority of people in the depressed areas do not to move not because of their irrationality but because of great information difficulties, and high search and psychological costs. Thus, not migrating is actually a rational choice for most people. Bluestone and Harrison's argument is also well supported by Clark's (1983:14) hypothesis about the high costs of out-

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migration on the communities of the depressed areas, such as reinforcing the decline of the regional economy and threatening those who would not migrate.

However, the undeniable fact is that the migration rate for the displaced workers is high. It indicates that migration is still an individual labor market strategy used by many workers, especially when laid off. Therefore, the question is still worth asking. The attempt to answer it will improve our knowledge about how well the displaced workers who moved fared relative to those who did not move in terms of income, employment and occupation. Since the evidence provided in the above section indicates that the majority of the displaced workers suffered earnings losses, the more appropriate question to ask should be about the economic losses rather than about economic gains due to displacement. It is unlike many previous studies on the outcomes of migration, which focused on the economic benefits based on human capital assumptions. Relevant to displacement, thus, the appropriate question should be: Did the displaced workers reduce the earnings loss by geographic mobility? Based on the discussion about the bipolarization of American labor market, this question may lead to another more fundamental question: Did migrants' pre-displacement labor market segments differentiate their migration outcome? In other words, displaced

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workers from which labor market segment were more likely to reduce earnings loss by migration?

The present study attempts to answer these questions empirically by exploring five waves of data from the Current Population Survey Displaced Workers Supplements (January 1984, January 1986, January 1988, January 1990 and January 1992), from a dynamic labor market segmentation perspective.

I.6. Contributions and Uniquenesses of the Present Study

The present study attempts to make several contributions to the current knowledge about the outcomes of labor market segmentation and migration for the displaced workers. First, the study intends to evaluate the argument that the U.S. labor market has been further bipolarized in recent years and thus to show that labor market segmentation as a historical process is continuing. Second, the current study intends to make a contribution to the existing literature of labor migration from a new structural perspective that has emerged since the early 1970s and thus to carry on the prolonged debate between human capital and neo-classical perspectives, which dominate labor migration research and labor market segmentation theory. Third, the study intends to enhance our understanding of two competing forces--migration as a labor market strategy of individual workers versus structural forces of labor market according to the dynamic labor market segmentation theory--under the circumstances of deindustrialization. In this sense, this study is an effort to link endogenous factors
at macro level with the outcome at the micro level. Last, I attempt to draw policy implications based on the empirical results.

The present study is unique in four important ways. The past research based on dual labor market theory has largely focused on 1) historical formation and process of industrial and labor market segmentation; 2) differential returns to human capital across the industrial and labor market segments; and 3) labor allocation to and mobility between segments. However, with regard to labor allocation and mobility, impact of the structural characteristics of the worker’s previous labor market segment on the future labor market outcome is largely neglected and needs to be understood. The first unique aspect of the present study, therefore, is to use the displaced worker’s previous locality in the segmented labor market as predictor of the economic outcome of displacement. In other words, it is assumed that distinctively different characteristics among the labor market segments, which have been "ascribed" to the displaced workers, should result in different post-displacement labor market outcomes. Secondly, this study is unique because it focuses on the two primary segments in the manufacturing industries, which were struck the hardest by deindustrialization. It postulates that the lower tier of the primary segment—subordinate primary segment—of the American labor market suffered more loss under the circumstance of deindustrialization. Unlike most previous labor market segmentation studies that emphasize the importance of the existence of an internal labor market in the primary/core segment versus the absence of such an internal labor

I. INTRODUCTION
market in the secondary/periphery segment and thus made insufficient effort in
differentiating the two distinct primary segments, the current study tries to stress the
differentiation in economic outcomes of the two segments in the external labor market
in the context of deindustrialization.

Thirdly, so far there has been very little literature in the labor migration
research that attempted to understand the effects of labor market segmentation on the
migration outcome. This study will be a pioneering effort in this area.

Finally, this study examines migration of displaced workers—a particular group
of American labor force—and the effects of displacement, of which we know very
little, during a particular historical period that witnessed the decline of America from
its economic crest. It is not comparable to any previous period of time in the history
of American capitalism.

I. INTRODUCTION
CHAPTER II

INTEGRATION OF INDUSTRIAL SEGMENTATION, LABOR MARKET
SEGMENTATION AND LABOR MIGRATION THEORIES

II.1. Introduction to Segmentation Theories

The discussion of the origin of segmentation theories has to be traced to dual economy theory, which was evolved from dissatisfaction with the neo-classical and human capital theories about the determinants of inequality in individual socio-economic achievements. The dissatisfaction arose from three sources: (1) Existing explanations only paid attention to individualistic variables and largely ignored structural variables; (2) the whole arena of inequality was dominated by the functionalist perspective in sociology and human capital theory in economics; (3) explanatory power of the empirical models from these perspectives is poor. In the decade of the 1970s, there was a resurgence of interest in the economic structure of capitalism. Quite a number of social scientists, first from the discipline of economics and then from the discipline of sociology, such as Crowder (1974), Horan (1978), Beck et al. (1978), Robinson and Kelly (1979), Bibb and Form, (1977), and Kalleberg and Griffin (1980), began to question the utility of the individualistic status attainment variables in explanation of income inequality and proposed dual economy theory. This line of theorization was labeled by Baron and Bielby (1980) as "new structuralism", for its emphasis on structural factors of inequality.

II. INTEGRATION OF THEORIES
When the dual economy theory was first proposed, however, its operationalization confounded the features of the economic organization of firms such as firm concentration, profits, capital intensity, with characteristics of labor force and labor markets, such as skill-levels, education and training, earnings, race and gender. Firm characteristics and labor market attributes of individual workers were almost used interchangeably. The underlying rationale is that there was a correspondence between aspects of firms' economic organization and labor force consequences. It was not until the late 1970s and early 1980s that researchers (Althausen and Kalleberg 1981; Edwards 1979; Hodson 1978) began to recognize the importance of the distinction between these two dimensions of dual economy and make efforts to distinguish them in operationalization. According to Tolbert (1982:457), this dual economy theory has developed into two major versions: Labor market segmentation theory and industrial segmentation theory. As Wallace and Kalleberg (1981:80) claim:

Dualistic explanations of the macroeconomy have proceeded at two related, but conceptually distinct, levels. First, there is the dual economy proper literature, which pertains directly to the organization of firms and industries. Second, there is that branch of dual economy theory more properly referred to as "segmented labor market theory," which focuses on the structure of jobs and the experiences of individuals in jobs.

With regard to the interrelationship between the labor market segmentation and industrial segmentation, however, they also recognize (1981:98):

... It is sufficient to say that internal labor markets for much of the upper tier of the primary market derive from occupational power and may therefore cut across industrial boundaries. Internal labor markets for the lower tier of the

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primary market (mainly white-collar clericals and blue-collar craftsmen and operatives) are embedded in the organizational structure of the firm and, therefore, tend to be industrially based...

In parallel with the discussion of two dimensions of a segmented economy, there has been a debate about their superiority in explanatory power. Some researchers (Pore 1973; Beck et al. 1978; Hodson 1978; Oster 1979; Tolbert et al. 1980) believe that the correct approach of operationalizing segmentation should be based on characteristics of industries, firms and companies while other researchers (Osterman 1975; Rosenberg 1980; Rumberger and Carnoy 1980; Meng 1985; Dickens and Lang 1985; Sakamoto and Chen 1991b) emphasize occupational characteristics as proxies for segmentation. Piore (1973) actually rules out the use of industry as well as occupation-level data to define the labor market segmentation. For him, the firm is the only proper unit of analysis and in-depth case study is the only correct approach for segmentation research. Baron and Bielby (1980) urge researchers to bring back the firms in segmentation research. In their study, Dickens and Lang (1985) examined the extent to which the earlier studies, using either occupational characteristics or industrial characteristics, had misclassified workers in the labor market segments and industrial segments. They find that occupation-based schemes do a better job of classifying workers between segments than do industry-based schemes. Sakamoto and Chen (1991b) reviewed a variety of studies (e.g., Hodson 1984; Kalleger and Griffin 1980; Kalleberg, Wallace and Althauser 1981; Parcel and Mueller 1983; Wright 1979) and find that most of them showed persistent effects of occupational variables

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even after controlling for other structural variables. They also find that labor market segmentation research based on occupational characteristics seems to have yielded more consistent findings regarding the returns to human capital (Osterman 1975; Rosenberg 1976, as cited in Zucher and Rosenstein 1981) whereas results based on industrial-based sectors have been highly inconsistent.

Hodson (1984) argues that both companies and industries represent meaningful units of analysis that embody consequences for economic segmentation. The evidence from his analysis of data from the Wisconsin Longitudinal Study of Schooling and Attainments indicates that the most important company characteristic in the wage determination process is the employment size while the most important industrial characteristic is the level of capital usage. Evidence from Beck et al.’s (1978) and Wallace and Kalleberg’s (1981) studies of core-periphery sectoral differentials in earnings indicates that as a control variable, the occupation-based labor force composition variable has independent effect on earnings. In other words, there is no perfect correspondence between industrial sectors and labor markets. As Wallace and Kalleberg (1981:80) point out:

... features of the economic organization of firms are reflected in labor market outcomes, but the correspondence is not as strong as has often been assumed. Since most attempts to justify a relationship between dual economy and dual labor market theories have been unsystematic, the theoretical justification for relating features of firm organization to labor markets has been weak and its empirical basis has been virtually ignored.

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In addition, according to Rosenberg (1989:371) "an occupation may have different qualities depending upon whether it is located in a core firm or a peripheral one." Therefore, it is quite useful for researchers to look into both the effects of industrial and occupational-based labor market segmentation or the interrelated effects of them at the same time.

II.2. Industrial Segmentation Theory

The branch of the segmentation theory that has been primarily concerned with the characteristics of economic organization is often labeled industrial segmentation theory, or simply industrial dualism, or synonymously dual economy theory. Different authors use different terms to refer to the same dichotomous structure of firms and industries. "Center" and "periphery" firms by Averitt (1968), "monopoly" and "competitive" sectors by O'Connor (1973), "planning" and "market" systems by Galbraith (1973), and "oligopoly" and "competitive" by Shepherd (1979) are the most representative of all.

Averitt (1968:1) asserts that center firms differ from periphery firms on almost every imaginable aspects, such as "economic size, organizational structure, industrial location, factor endowment, time perspective, and market concentration." The most fundamental requisite that a center firm must possess is the ability to successfully adapt to the technical evolution of production. As more capital investment is made in modern machinery and equipment and as different stages of the production process

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are successfully integrated under one corporate roof, larger economies of scale prevail. Thus the criteria for assigning segments must be cut along the two primary dimensions: (a) the prevailing technical system of production in an industry; and (b) location in key or non-key industries. For Averitt, the dichotomy between large firms with substantial market power and small, competitive firms is the fulcrum upon which American business dualism rests.

O’Connor (1973) adopts the view that the state constitutes a third sector of production alongside the monopoly and competitive sectors. He places a major emphasis on the state’s role in facilitating the capital accumulation process, especially for firms in the monopoly capital sector: (a) the encouragement of the conditions where accumulation of capital is possible; and (b) legitimation, or the maintenance of social harmony among conflicting groups in society. These functions are served in various ways: The purchase of products from private enterprises, the socialization of the costs of production through taxation policies, and moderate redistribution of income through a myriad of transfer programs.

Galbraith’s (1973) distinction between the planning and market systems breaks into the matrix with technology and its resultant impact on the organization of the firm. According to Galbraith, as technology advances, a greater gestation period is required between initial investment and realization of profits from a final product. Firms will never venture into such costly technologies unless they possess some modicum of market power. Such power is disproportional possessed by the firms in

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the planning system, which often runs against the rationale of the neoclassical model that production should respond to consumer preference. The competitive firms in the market system will not make such investment.

Summing up the above three variants of the industrial segmentation theory, the distinctive lines between the dichotomous sectors of the U.S. industries, are size, organization, technology, state involvement, and market power.

II.3. Labor Market Segmentation Theory

The initial dual labor market theory by Kerr (1954) views the labor market consisting of several Balkanized and relatively noncompeting horizontal segments, between which mobility is limited. However, Doeringer and Piore (1971) and Gordon (1972) recognized the crucial significance of the vertical (hierarchical) dimension of labor market structure as well as that of the horizontal dimension.

Hierarchically, Piore (1975) divided labor markets into primary and secondary markets. In what Piore terms the primary market, there are internal labor markets (Doeringer, 1967; Doeringer and Piore, 1971) that play a central role. For workers, it is a vehicle to both higher wages and greater stability of employment. In contrast, conditions of employment in the secondary market, which is more a genuine market in the sense of the absence of internal market, tend to be low-paid, with little possibility of advancement, and poor working conditions. Consequently, secondary jobs are associated with considerable instability among both jobs and workers.

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Further, the highly personal relationship between workers and supervisors "leave wide latitude for favoritism and is conducive to harsh and capricious work discipline" (Piore 1975:126).

Piore (1975) divides the primary market into upper and lower tiers. The upper tier is marked by the presence of a large degree of personal autonomy for its jobholders; this suggests that, to some extent, labor market segmentation is occupationally based and may be independent of firm characteristics.

In Gordon’s terminology (1972), segmentation is a separate division within a stratum, within which several different labor market segments may co-exist, resistant to the forces of external competition. In their work entitled "A Theory of Labor Market Segmentation", Reich, Gordon and Edwards (1973:395) provide us with a useful summary of labor market segmentation theory:

We define labor market segmentation as the historical process whereby political-economic forces encourage the division of the labor market into separate submarkets, or segments...Segments may cut horizontally across the occupational hierarchy as well as vertically...

They (1973:395-396) went on:

The primary and secondary segments, to use the terminology of dual labour market theory, are differentiated mainly by stability characteristics. Primary jobs require and develop stable working habits; skills are often acquired on the job; wages are relatively high; and job ladders exist. Secondary jobs require and often discourage stable working habits; wages are low; turnover is high; and job ladders are few. Secondary jobs are mainly (though not exclusively) filled by minority workers, women and youth...

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Like Piore, Gordon, Reich and Edwards divided the primary sector further into two segments which they call "independent primary" and "subordinate primary" (1973:396):

Within the primary sector we see a segmentation between what we call 'subordinate' and 'independent' primary jobs. Subordinate primary jobs are routinized and encourage personality characteristics of dependability, discipline, responsiveness to rules and authority, and acceptance of a firm's goals. Both factory and office jobs are present in this segment. In contrast, independent primary jobs require creative, problem-solving, self-initiating characteristics and often have professional standards for work. Voluntary turnover is high and individual motivation and achievement are highly rewarded.

In sum, opportunities in pay, skills, work autonomy and mobility prospects range from very good in the independent primary segment to very poor in the secondary segment. It may make a big difference in the outcome of workers who bore roughly the same individual endowments in human capital when they first entered the different segments of the labor market. A critical element in the segmental dynamics was structural asymmetry between the primary segment and secondary segment: There exists an internal labor market structure in primary segment, whereas an equivalent structure is lacking in secondary segment. The internal labor markets are relatively non-competitive and well-protected islands within a more competitive environment of external markets. The only decisive competition usually takes place at the port of entry.

II.4. Dynamics of Segmentation and Deindustrialization

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A commonality of variants of segmentation theory is that they all recognize a stable structure of industries, firms, jobs and pay inequalities. However, they pay little attention to the dynamics of segmentation. Regarding the fact that the classical segmentation theories lack dynamics, some authors (Rosenberg 1981; Sengenberger 1981) argue that corporations seem responsive to both cyclical and secular economic changes and consequently the extent of division of segments depends on fluctuation of demand for their products. Other recent research suggests that the perception of a labor market with fairly stable structures of pay and jobs is no longer matching the reality of the restructuring American economy (Noyelle 1987; Wallace and Kalleberg 1981; Wilkinson 1981).

Recognizing the segmentation of the labor market before the 1970s as the result of development of oligopolistic and monopolistic capitalism since the 1920s, Gordon, Edwards and Reich (1982) also pointed out that since the late 1960s and the early 1970s, the trend has essentially been reversed due to the increasing internationalization of the competitive product markets, and computerization and robotization of production. As the world economy began sliding into sustained economic crisis, the prevailing segmentation began to decay; the employment protection embodied in the internal market is giving way to the competition between the external markets; the explorations for the accommodation of the new economy is under way that will significantly alter existing institutions in each of the three principal labor segments. Although uncertain about the future of the segmentation,

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Gordon, Edwards and Reich (1982:226) ascertain that, "a reshuffling of the boundaries of the different labor segments and changes in their internal structures are taking place."

Rosenberg (1981:230) notes that theories of class structure based on the existence of labor market segments implicitly assume that workers remain in particular segments throughout their working career. He argues that this view is obviously contrary to the Marxian theory of the reserve army of labor, which assumes that workers in the secondary labor market do not remain in this segment throughout their working career; rather during economic upswings some of these workers would be expected to move to the primary market and many would return to the secondary sector during economic downturns. However, by merely touching upon the mobility between the labor market segments during upswing of the economic activities of businesses, Rosenberg did not adequately address the issue of secular changes in the labor market segmentation.

Sengenberger (1981) tried to create a synthesis between competing paradigms in segmentation theory. According to him, the interests of the employers in segmentation differ in periods of tight labor market conditions and slack labor market conditions. He hypothesized that in periods of tight labor markets, and when the economy approaches full employment, competition among employers for labor, particularly skilled labor, increases and it becomes more and more difficult to recruit and keep employees. In this situation the employers will be inclined to resort to a

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strategy of inclusion in order to diminish competition from other firms. In other words, building internal markets is more likely to be used as a strategy of keeping superior labor-power. But with slacking or declining overall demand for labor, upward mobility streams are stopped and may even be reversed. Employers striving for the full potential profit during the slack now try to do away with the barriers around their internal markets to provide for as much inter-changeability with the external market as possible.

Kreckel (1980) seems more relevant in this respect despite the fact that he is still unable to go beyond the limitation of the business-cycle perspective. He contends that (1980:535):

They [corporations] are interested in being able to adjust their workforce quickly and cheaply to cyclical developments outside their control. Their solution is to provide a 'buffer zone' of low-qualification secondary jobs whose incumbents are easily fired, and easily hired again, in external markets without having much chance of ever entering a more protected internal market.... The labor markets in advanced capitalist societies are said to have a strong tendency towards polarization in two sharply distinct types of jobs and workers, a 'primary' and a 'secondary' stratum. On the other hand, the further distinction between 'independent' and 'subordinate' submarkets inside the primary stratum is much more tentative and certainly requires further differentiation and specification.

However, most studies of segmentation make their arguments based on the large industrial corporations which are relatively immune from short-term cyclical influences and therefore are able to maintain a relatively stable labor force. Obviously, this is no longer true during deindustrialization. Although still concentrating on the large corporations with the above belief, Muller et al. (1978

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cited in Kreckel 1980:539) have predicted a bipolarizing trend in the job market by distinguishing between two types of skilled and two types of unskilled workers in industry in the degree to which they suffer from reduction of bargaining power facing the technological changes in their industries: Among the skilled workers, the authors differentiate between (a) 'revalued' and (b) 'threatened' qualifications, thus referring to the tendency towards polarization among occupational qualifications connected with technological changes. Only a relatively small group of highly qualified (revalued) workers belong to the 'independent primary labor market sector' of the dual labor market theory are able to keep up with realistic options in the external labor market. Whereas for the rest, on the one hand, market value of their general occupational qualifications diminished, and on the other, they increasingly depend on internal labor markets. As a result, their risk of being replaced by or thrown together with the two unskilled types, i.e., (c) specialized workers without general occupational qualifications, whose on-the-job-training only qualifies them for internal markets and (d) unqualified or dequalified workers without any specialist skills (Kreckel 1980:540). This description of the devaluation process is quite close to the fate that the manufacturing workers are facing during deindustrialization in the United States.

Rosenberg (1989) notes that in response to the recent development of labor market segmentation, researchers along the line of segmentation theory have shifted their foci away from discussing the existence of segmentation to analyzing the restructuring occurring in the labor market. For instance, Rosenberg (1989:393)

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conceptualizes the notion that the relatively rigid labor market segmentation is moving
toward labor market flexibility. From the employers' labor market strategy vantage
point, he summarizes three types of flexibility often being analyzed (1989:393):

...wage flexibility, numerical (or employment) flexibility and functional
flexibility. Wage flexibility refers to the extent to which wage levels or
differentials can be adjusted to prevailing labor market conditions. Increasing
numerical flexibility means expanding the freedom of employers to vary the
amount of hours of work and the size of workforce in response to cyclical or
structural variantions in demand and/or technological change. Functional
flexibility concerns the ability of a firm to effectively utilize its relatively
permanent full-time workforce by varying the work performed to the changing
requirement of production.

II.5. Usefulness of Labor Market Segmentation Approach

The above versions of dynamic segmentation theory have not reached beyond
the business cycle assumption of dynamic segmentation. However, the
deindustrialization perspective (Bluestone and Harrison 1982) views labor market
restructuring as an inevitable trend of technological changes and redivision of labor in
the world economy. Relative to business cycles, deindustrialization is much more a
fundamental change, which is leading the American economy to a totally different
mode (Cf. Robert Reich 1991).^ Thus displacement is more than just a response to the

^ Robert Reich (1991) gives a very good description of the future models of
businesses regarding their sizes and operation as in his book entitled The Work of
Nations: Preparing Ourselves for 21st Century Capitalism. He also reclassifies the
American labor market into declining routine production services (those on assembly
line, routine supervisory jobs, and data processors), growing in-person services (in
direct contact with those they serve) and growing symbolic services (problem-solving,
problem-identifying and strategic brokering activities).

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business cycle. The majority of the jobs disappearing from the American job markets are due to the structural changes and thus will not come back when the economy enters the upswing of the next cycle. As Hamermesh (1989:58) points out: "(T)here is always substantial job displacement in a dynamic, developed economy; but displacement has shown a secular increase in the U.S. that is independent of the business cycle." Thus, Noyelle (1987:1) noted:

We stand at a critical juncture in U.S. economic, social, and technological history... We are witnessing no less than the demise of an earlier economic system, centered on the mass production and mass marketing of industrial goods, and the emergence of a new paradigm of economic development emphasizing services, flexible production, and customized consumption. The rise of this new economy is bringing about a fundamental restructuring of both markets and jobs. Industrial dualism—the old way of structuring markets and jobs in the economy—is fast disappearing.

Noyelle (1987:15) contends that the most serious challenge to the integrity of industrial dual labor markets came from the dismantling of various elements critical to the articulation of internal labor markets and increasingly extensive reliance on the external labor markets. Under industrial dualism, the capacity of core firms to offer primary employment was in large measure related to their ability to operate in an oligopolistic or monopolistic environment (e.g., the steel, automobile, local gas and electric utilities, and telephone industries) (Noyelle 1987:100). Now a new labor market dynamic is emerging, under which the role of the firm as the principal locus of upward mobility is weakening, except perhaps for workers in the highest stratum.

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Increasingly, mobility must be sought through job hopping and additional education (Noyelle 1987:116).

Accompanied with the change in the dynamics of occupational mobility in the American labor market was the change in earnings distribution. According to Harrison and Bluestone (1988:121), if we look specifically at the trends in low-paying ($11,103 and less), middle-paying ($11,104-$44,412) and high-paying jobs ($44,413 and over), we will find that the trend is toward polarization, at least among the roughly 60 percent of the American labor force that works year-round and usually full-time (YRFT). In other words, since the late 1970s, the proportion of the labor force earning low wages has grown steadily, the proportion at the top of the distribution has also expanded (but not as much), and the middle group has shrunk. This may not imply literally an economy with a "missing middle" but it certainly shows an economy in which the center is contracting. This pattern of the proliferation of low wages and the polarization of jobs is by no means confined to only a few subpopulations. The polarization is becoming increasingly universal, no matter what the color of workers' skin, their sex, their age, or for that matter, the industry within which they work (Harrison and Bluestone 1988:126). The low-wage work force in American labor market increasingly includes a large contingent of middle-class citizens—or, at least, citizens who have up to now thought of themselves as middle-class (Harrison and Bluestone 1988:127). In a nutshell, the American job market as a whole is among other things experiencing a genuine reshuffling featured by the

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polarizing job opportunities and declining middle class (Kuttner 1983). Theorists such as Bluestone and Harrison (1982), Kuttner (1983) and Thurow (1984) attribute this phenomenon to declining employment in smokestack industries and growth of high tech industries, low paying occupations, and service-producing industries.\footnote{Interestingly enough, Horrigan and Haugen (1988) find that the declining proportion of families in the middle was due to the fact that most of those middle-income families have moved to the upper class, although the share of income held by the lower class has declined.}

The dynamic segmentation arguments seem to suggest that due to the structural changes occurring in the American labor market, the classical segmentation perspective becomes less useful. However, there is a linkage between the dynamic segmentation theory and declining middle class proposition. That is, if the declining middle class proposition holds, what we should expect to see is that lower-tier primary workers, a group which heavily overlaps middle class and lower middle class, would suffer more downward mobility and more earnings loss. \textit{Thus the utility of the conception of labor market segments in examining labor market outcome of the displaced workers lies in its proxy for the structural changes in labor market.}

\section*{II.6. Integration of Labor Market Segmentation and Labor Migration}

Neo-classical economics and human capital theories postulate that people will fare better through migration based on the assumption of people’s rationality and the efficiency of market mechanisms. The segmental labor market theorists stress,
however, that whether people fare better or not largely depends on where they are located in the segmented labor markets. Application of segmentation theory in geographic labor mobility to a large extent copies the application of the theory to the occupational mobility of labor. Usually such studies start from a critique of either neo-classical labor market theory or human capital theory. The segmentation theory in migration emphasizes the effect of opportunity structures. That is, equally qualified individuals from different labor market segments have different occupational and economic outcomes of migration. Thus it leads to the conclusion that migration as a means of occupational and economic mobility does not work to an equal degree for all the workers across the segments of labor market. Migration does not benefit the workers disadvantageously located in the secondary/periphery segment as much as the workers advantageously located in the primary/core segment (Rohr-Zanker 1990). In short, it is argued that because of their attributes "ascribed" by their respective labor market segments, workers from the primary segment of the labor market will be more

6 Rohr-Zanker (1990) did such a thorough critical review of human capital theory and neo-classical theory in labor migration literature that it is worth summarizing here. Her critique mainly focuses on the underlying assumptions of these two major theories. In the human capital theory, as a labor side theory, according to Rohr-Zanker, the underlying assumptions are: 1) individuals are able to calculate the present value of returns to the future as well as to the alternative choices; 2) monetary return is the only consideration in the cost/benefit calculation; 3) migration is a lifetime commitment; 4) pull-push factors exert equal influence on all potential migrants; 5) migration decision-making is a coercion-free process. The major underlying assumptions of neo-classical theory are: 1) symmetry power relation between labor and capital in the labor market; 2) convergence (equilibrium) in the economic performance between regions; 3) labor works alone in the labor process.

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likely to enter the primary segment by migrating and thus benefit from migration, while the workers from the secondary segment will be less likely to ascend into the primary segment by migrating and thus not benefit from migration. Whereas from the dynamic segmentation perspective, downward mobility is more likely and upward mobility is less likely for the workers in the middle stratum during the time of economic restructuring. This tendency has been reemphasized by the bipolarization hypothesis.

The advantages of examining migration of displaced workers in a labor market segmentation framework are two-fold: First, it corrects the previous overemphasis on the factors of supply side of labor by human capital theory. Second, it throws light on the importance of labor market constraints external to the workers. However, a static labor market segmentation approach seems too simplistic to take into account the impact of the 1980s restructuring of the labor market that the displaced workers are facing. Therefore, in contrast with the conventional labor market segmentation hypothesis that posits that the workers of the secondary market are an absolutely disadvantaged group while the workers in the primary segment an absolutely advantaged group, the thesis of this study is:

_Deindustrialization is bipolarizing the segmented hierarchical structure of the U.S. labor market along the lines of skills, employment as well as earnings. In the primary segment, this process has affected the workers in the subordinate segment relatively more than the workers in the independent segment. Due to the_

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corresponding structural changes along the lines of these two subsegments in the primary segment, the classical segmentation scheme should remain a good proxy for the structural inequality of labor markets for the displaced workers during the years of economic restructuring in the U.S. Within this framework of dynamic segmentation, the outcomes of migration as an individual act will be constrained by the changes of the economic structure.

Based on the above conceptual thesis, two propositions are developed:

1) Workers displaced from the subordinate primary segment of the labor market suffered more earnings loss and longer duration of unemployment than the workers displaced from the independent primary segment.

2) Migration, rather than being equally beneficial to all the displaced workers, was more likely to minimize earnings loss and duration of unemployment for the workers displaced from the independent primary segment than for the workers from the subordinate primary segment.

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CHAPTER III

LITERATURE REVIEW: SEGMENTATION STUDIES

III.1. Introduction

This literature review looks into the empirical evidence from previous studies along the lines of: (1) industrial segmentation; (2) labor market segmentation; (3) industrial and labor market segmentation combined; and (4) dynamics of segmentation. This section covers these four topics of literature, because they reflect distinct but interrelated, and somehow and somewhere overlapping dimensions, of the same segmented economy. The final section of the current chapter examines the literature on dynamics of labor market segmentation. This topic should be most relevant for the current study because the purpose of this study is to find implications of the effects of the American economic restructuring on labor market segmentation and how they in turn affected the displaced workers.

III.2. Industrial Segmentation

Following Averitte (1968) and Bluestone and colleagues (1973), Beck et al. (1978) allocated to the core sector those industries which exhibit high levels of capital

7 Many authors use the term "dual economy" to refer to industry-based segmentation and use the term "dual labor market segmentation" to refer to the occupation-based segmentation. In order to avoid confusion, I consistently use industrial segmentation and labor market segmentation in this thesis. In addition, this study tries to include those researches that cover both of them.
intensity, unionization, large assets, high profit margins, product diversification, and market concentration. Industries were assigned to the peripheral sector because of their small firm size, seasonal and other variations in product supply and demand, high labor intensity, weak unionization, and low assets—all characteristics attributed to competitive capitalism. Using National Opinion Research Center’s General Social Surveys for 1975 and 1976, they developed a covariance regression model and found that the core and periphery sectors do exhibit significant differences in both earnings levels and in labor force composition. The relationship between earnings and human capital as well as occupational-labor force variables, do differ significantly between core and periphery sectors. In general, the real dollar returns are greater for the workers in the core than in the periphery.

Oster (1979) raised the question of whether there is a dualistic structure in the American industries, regardless of the existence of variants of the dual industrial theory. Due to limitations in availability of comparable data, Oster restricted his analysis to 83 three-digit 1960 Census code industries in agriculture, mining, construction, manufacturing, transportation, communications and utilities. He first did a factor analysis on three sets of factors—a tentative dual economy factor, a sex factor and a race factor—assuming that the dualism should be along these lines. It turns out that his dual economy factor "loads" significantly on a factor relating to industrial size, concentration and unionization. Further, Oster assumes that if the dualism theory as a whole holds, an underlying bimodal distribution of the American industries

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should emerge. He finds evidence that the sample under consideration is in fact composed of two normal distributions as hypothesized.

Using data from the March 1976 Current Population Survey, Tolbert et al. (1980) tried to test the dual economists' expectation of a common dimension underlying indicators of economic concentration and scale and the characteristics of product and labor markets. The empirical indicators of oligopolistic/competitive market structure used in the analysis fall into one of the three basic categories introduced above: 1) measures of the capacity for oligopoly in an industry; 2) measures of oligopolistic behavior in the industrial product market; and 3) measures of oligopolisticity in the industrial labor market. The authors aggregated 215 1970 Census industry categories to a total of 55 groups to correspond with the archival data sources and allow maximum use of available information. Then they did factor analyses on 9 indicators for these industries. The solution is unidimensional with all variables loading on a factor at .42 or higher. Then they use the factor scores to define an index of segmentation for industrial categories and divide industries into a core sector and a peripheral sector with the break point in the central part of the distribution. In the meantime, Tolbert et al. (1980:1115) also maintained a continuous measure, for "...researchers may choose either dichotomous or continuous measures

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8 The authors got rid of 8 redundant variables out of a group of 17 variables.

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without substantial loss of explanatory power," based on following consideration (1980:1113):

The dichotomous measures will be more appropriate for research on social and economic processes thought to be conditioned by the economic organization of industry. ...The continuous measure, in contrast, treats a unit difference in economic differentiation as equivalent no matter where in the scale it appears.

The results indicate that the addition of either measure of economic segmentation represents a significant increment to the explanatory power of the baseline model containing only individual variables. In addition, all of the effects of those individual attribute variables are greater in the core than in the periphery, implying that returns to human capital are greater in the core than in the periphery. Thus, it supports the fundamental hypothesis of the dual economy theory.

Leon (1985) applied Tolbert's (1978) scheme of segmentation to the investigation of determinants of economic resource levels among the recently retired workers by exploring the longitudinal data from the Panel Study of Income Dynamics. Three income determination models (status attainment/career change model, human capital model and economic segmentation model) are developed to examine significant predictors of retirement income and wealth. Although the findings suggest that all three models explained substantial amounts of variance of post-retirement economic well being, the explanatory power of the segmentation model is substantially greater than for the other two models.

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Using data from the 1977 General Social Survey, Lord and Falk (1980) also applied Tolbert et al.'s scheme to their comparative study between a structural model and a human capital model for income differentiation. They find that although the human capital variables explain a greater amount of variance than the structural variables, a combined model with the structural variables increases the explanatory power by 27 percent. Interestingly enough, they also find that the structural model worked better for men whereas the human capital model worked better for women.

Tolbert (1982) applied the same measure developed by himself and his colleagues (1980) to his investigation of the largely neglected hypothesis that industrial segments constrain career mobility. Using data from the National Longitudinal Survey of men age 45-59 at the survey time for a period from 1966 through 1975, Tolbert employed a conventional mobility analysis to study men's occupational mobility within and between oligopolistic and competitive industrial sectors. Results of the analysis suggest that influence of industrial sectors is most apparent in late career mobility patterns where sectors appear to be relatively impermeable barriers to mobility. The effect of industrial sectors on earlier intragenerational mobility is also evident in the analysis.

Along the race and gender lines, Beck et al. (1980), using data from the 1976 Current Population Survey, evaluate the existence of two mechanisms in determining the inferior position of minorities within the socioeconomic structure of industrial capitalism: The first is the differential assignment of minority labor to different

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segments of the industrial economy, and the second is the differential evaluation of minority credentials within different industrial segments. To examine the existence of the first mechanism, they regressed a binary variable for sector location on two binary variables for race and sex. They find that minority labor runs a disproportionate risk of being located in the peripheral sector, and that this pattern persists even after controlling for traditional human capital factors. Moreover, whereas race and sex play a significant role in sectoral assignment, economic sectors cannot be reduced just to perfectly corresponding groupings with sex or race. To examine the existence of the second mechanism, they computed an adjusted earnings level for each group and found large variations in the earnings returns to the human capital. Specifically, the dollar returns to human capital are greater for whites than nonwhites, for males than females, for those located in the core than those in the periphery.

In a study of the former Comprehensive Employment and Training Act (CETA) in the area of Kentucky, Hougland (1985) used Hodson’s (1978) method by including two proxy variables for dual labor market, one of which is number of employees of firms and the other is industry which was converted into Standard Industrial Classifications (Office of Management and Budget 1972) and then recoded into core (primary) and peripheral (secondary) sectors. Hougland (1985:908) argues that he chose Hodson’s method because Hodson’s measure most closely reflects major economic organization variables. He found that industry affects income and

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occupational status even after individual background, economic context variables and plant size have been controlled.

In sum, most of the studies on industrial segmentation indicate a dualistic industrial and firm/company economy in the U.S. without doubt. Kaufman et al. (1981), however, questions the simplistic division of the economy into core and periphery and argues that it does not do "justice to the complexity of the structure of the U.S. economy" either theoretically or empirically. They collected a wide range of data at a detailed level of industrial classification for the vast majority of their measures and did a factor analysis on them. Based on the factor scores they computed the inter-industry distances and used these distances as input to a hierarchical clustering procedure and came up with a 16-cluster solution aligned differently with the profit-seeking, technology, environment, union struggle, and government intervention instead of a consistent dichotomy. Therefore, they believe that this categorization is superior to the prior one because it more fully reflects the multidimensionality of economic segmentation.

III.3. Labor Market Segmentation

As I mentioned at the beginning of the current chapter, some researchers emphasized the labor market characteristics of occupations and along this line they divided the labor market into segments. Among the earlier such attempts, Osterman (1975) places 3-digit United States Census occupations into either the primary sector--
upper-tier or lower-tier—or the secondary sector based on his own judgement according to dual labor market theory. Basically, jobs placed in the secondary sector are characterized by low wages and unstable employment patterns; upper-tier primary sector jobs are high-wage jobs with a high degree of work autonomy; all other jobs are classified as lower-tier primary sector jobs. Using a sample of urban males in the United States from the 1967 Survey of Economic Opportunity, he estimated earnings functions for a pooled sample of Blacks and Whites as well as separate earnings functions for Blacks and Whites in each labor market segment. Osterman finds that earnings depended only on amount of time worked in the secondary segment. In the upper tier of the primary segment, education raised earnings but not in the lower tier. The separate regression models for each racial group show basically the same pattern of results except that educational attainment is found to have a significant impact on the earnings of Blacks in the secondary labor market. Rosenberg (1989:375) points out that Osterman underestimated the size of the secondary segment relative to the lower tier of the primary segment in the U.S. because he assigned 90% of the sample to the lower tier of the primary market. According to Rosenberg (1989:375), this underestimate "casts doubt on the results, particularly in the secondary sector."

There has been frequent criticism about the sample selection bias common in the labor market segmentation research measuring average work force characteristics of firms. Such selection bias is believed to have largely invalidated the findings of higher returns to schooling and experience in the primary segment. In response to this

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criticism, Sakamoto and Chen (1991b) use Osterman's (1975) occupational definition of the dual labor market to investigate earnings determination among prime-age male employees in the 1979 Current Population Survey. Results from multivariate analyses of log weekly-earnings indicate that the effects of schooling and experience are smaller for the secondary sector workers. With a restricted model, which indicates the error term of a probit equation and error terms of the earnings regressions are not correlated, Sakamoto and Chen (1991b:191) claim that this sectoral differential for the effects of schooling and experience is not compromised by sample selectivity.

Rosenberg (1980) matches labor market segment characteristics to each of the over 13,000 DOT (Dictionary of Occupational Titles) occupations (1=present, 0=absent) for a sample of individuals in Brooklyn, Cleveland, Detroit and San Francisco from the 1970 Census Employment Survey (CES) of low-income urban areas. A cross-classification matrix is developed, which lists for each of the 3-digit 1960 Census occupations the probability of possessing characteristics for each of the DOT occupations. From these probabilities and the DOT information, expected job characteristics and skill requirements for the Census occupations are calculated. These scores, ranging from 0 to 1, refer to the estimated probability that a worker is in a certain labor market segment. Obviously, Rosenberg's scheme is more objective than Osterman's eyeballing scheme. However, it classifies occupations into only primary and secondary segments without consideration of the important distinction of a lower-tier and a upper-tier in the primary segment. From the findings, Rosenberg (1980)

III. LITERATURE: SEGMENTATION STUDIES
concludes that explanations based on differential human capital attributes of individuals are helpful in explaining initial career position, but less helpful in explaining upward occupational mobility in the middle of working life. He also found that within low income areas, some mobility did exist between the primary and secondary sectors of the labor market. Whites in low income areas, though relatively disadvantaged as compared to the counterparts in the surrounding SMSA, were less likely to be in the secondary labor market, and more prone to show upward occupational mobility if they began their career in the secondary labor market.

Rumberger and Carnoy (1980), using a national male sample with information from the 1/1000 Public Use Sample of the 1970 Census, investigated occupational mobility and earnings differentials of Blacks and Whites from 1965 through 1970. Rumberger and Carnoy (1980) divide the occupations into the secondary, craft, primary subordinate, and primary independent segments by linking characteristics of jobs such as Specific Vocational Preparation (SVP) and Relationship to People (RP) as described in the Dictionary of Occupational Titles to the 1970 census occupational classifications. They purposefully leave the General Education Development (GED) in DOT out of their categorization since they use worker’s education as a variable in their mobility and earnings regressions. The uniqueness of their categorization is that they create a ‘craft’ sector in addition to the conventional three-segment division of labor markets because high training levels of some occupations such as dancers and brickmasons make them unfit in any of the three segments. The findings indicate that

III. LITERATURE: SEGMENTATION STUDIES
differential human capital attributes such as education, training and age are better able to explain mobility patterns in their model than in Rosenberg’s (1980). And education strongly influences the mobility of Whites and to a lesser degree the mobility of Blacks. Consistent with dual labor market theory and previous findings, their model for the determination of earnings indicates that for White and Black men who remain in the secondary segment during the period of 1965 to 1970, age and education are essentially unrewarded while the opposite is true in the primary segment. An interesting result they found is that the average level of earnings and earnings function of Black males in the primary subordinate segment are similar to the average level of earnings and earnings function for White men in the secondary segment.

Meng (1985) determines the components of the three segments of the Canadian labor markets--upper-tier primary, lower-tier primary and secondary--on the basis of occupational scores on the Blishen-McRoberts socio-economic indexes. Using a sample drawn from the Canadian National Mobility Survey of 1973, Meng estimated earnings functions for the workers of these three labor market segments. Consistent with labor market segmentation theory, his results suggest that there is no return to education and experience in the secondary sector while returns are found for the workers in both segments of the primary market. Workers of the upper-tier primary

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9 Meng (1985:281) notes that his definition of labor market segmentation for Canada closely resembles Rumberger and Carnoy’s (1980) for the United States.

III. LITERATURE: SEGMENTATION STUDIES
market receive greater reward for their additional schooling and experience than do workers in the lower-tier.

Dickens and Lang’s (1985) switching regression model examines a sample of male household heads from the 1983 Current Population Survey and finds strong support for the dual labor market theory: There are two distinct segments of labor market with different wage-setting mechanisms, and there is a queue for primary sector jobs. Dickens and Lang (1985) find that when segmentation variables are introduced into the wage equation, the return to experience and school in the secondary sector is essentially zero. The predicted wage is greater for the primary sector than for the secondary sector after one year’s experience, and is always greater for the primary sector thereafter. They also find that workers in SMSAs, married workers, more educated workers, heads of household, and whites are less likely to be in the secondary sector. Workers under age of 25 and workers above age of 60 are disproportionately located in the secondary sector.

More recently, some empirical studies of labor market segmentation theory used some other schemes on the basis of occupational characteristics. For instance, Friedman and Friedman (1986) explore the data from the Alternative Youth Employment Strategies Project by the Vera Institute of Justice under contract to the U.S. Department of Labor in the early 1980s. They assigned the youths in the project to four segments--secondary, craft, lower tier and upper tier--based on the questions asked about job characteristics in terms of benefits, skills, career ladders, unionization

III. LITERATURE: SEGMENTATION STUDIES
and weekly earnings. However, the data fail to yield a distinct dual labor market. They find that the majority (70\%) of these youth get jobs that teach them at least some new skills, some (30\%) get jobs that bring them with fringe benefits, one fifth get jobs with unions, and a quarter of them receive a pay raise within only a few months of starting the job. Thus Friedman and Friedman (1986:56) conclude that at the bottom, jobs do not fit the more extreme descriptions of secondary jobs as lacking all skills, benefits, and learning and "these results imply that segmentation models are not very fruitful as guides to the labor market experiences of youth at the bottom."

Considering this particularly high-risk subset of impoverished youths at the bottom as admitted by the authors, this result should be attributed to the high sample selectivity of this specific project.

Another more recent study on sectoral earnings differentials by Boston (1990) uses the data drawn from the question about the specific skills or training required for the current (last) job, contained in a supplemental questionnaire entitled "Occupational Mobility, Training, and Job Tenure" in the Current Population Survey, January 1983. Boston (1990:102) derives a mean percentage of YES responses to the question for each of the 14 two-digit occupations (excluding the Armed Forces) and divides the occupations into primary and secondary segments by a stopping criterion of two clusters. Consistent with the previous studies, the results indicate that the additional years of education and on-the-job training generate lower returns among secondary sector workers than among primary sector workers for all groups except black

III. LITERATURE: SEGMENTATION STUDIES
women; in addition, the results indicate that primary sector workers receive wage premiums. Hours are a major determinant of earnings in the secondary segment; Boston (1990) finds that secondary workers work fewer hours per week than primary sector workers. In addition, primary workers receive more on-the-job training; among the Black men and women, tenure and experience are greater in the secondary sector than in the primary sector. With regard to inter-sector mobility between 1982 and 1983 by race and gender, white women experienced the greatest upward mobility, followed by White men and Black men, while Black women experienced the least.

Probably the most relevant study to the present thesis is Rohr-Zanker’s (1990) pioneering study of differential migration effects on economic outcomes of workers across different labor market segments. Using data from the seventeen waves of PSID which covers the time span from 1968 through 1984, she assigned the workers in the sample to the three groups based on individual labor market information such as wage or salary per hour, employment status and occupational status, provided by the PSID data. Because of their uniqueness from the operationalizations by the previous studies, Rohr-Zanker named them as advantaged group, transitional group and disadvantaged

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group respectively. However, it is worth highlighting the transitional labor force group as specified by Rohr-Zanker (1990:82):

... [It is] comprised of workers of medium and low ranked occupations with moderate to high labor income, top ranked workers with moderate income, and workers with spells of unemployment or low income.11

III.4. Industrial/Labor Market Segmentation

As I discussed at the beginning of this chapter, some studies of dual economy theory looked at both the industrial and labor market segmentation and some try to combine these two by locating their cut-cross points. Reich (1984) did one of those studies looking at the development of both industrial segmentation and labor market segmentation. He uses DOT data on job characteristics to determine the components of the independent primary, subordinate primary and secondary segments in manufacturing industries, which he allocates between core and periphery by following the criteria established by Oster (1979). Reich’s (1984) findings provide evidence for the divergent trends of the American economy in the postwar period. The patterns of

10 Rohr-Zanker (1990:81-82) made distinction between economically advantaged, disadvantaged and transitional workers based on the labor market segmentation theory. The disadvantaged workers include those who were either unemployed at the least three weeks, or labor income in the previous year was not higher than regional average, or current income was 75% or less of the regional average. The economically advantaged workers include those who held either a professional, technical or kindred position (occupational codes 001-195), or had to be a manager, official, or proprietor (codes 201-245 or comparable). The transitional workers was defined as those who did not qualify for either of the other two groups.

11 The results of the study will be further discussed in the literature review of migration outcome in the next chapter.

III. LITERATURE: SEGMENTATION STUDIES
segmentation appear to have persisted through the period of economic crisis and institutional change that began in 1973.

In this respect, the most comprehensive effort ever made is probably Wallace and Kalleberg’s (1981) survey of the existing measures of dual economy developed by the previous authors. The study argues against the unidimensional definitions of the dual economy and uses factor analysis to examine commonality of these existing measures with a dataset of 68 industries. They argue that to a certain degree the impact of the economic organization of firms on labor force consequences is mediated by occupational structure. Their operational measure of the occupational structure is the percentage of the industry’s work force employed in each of ten major occupational classifications: professionals, semiprofessionals and technicians, managers, office clericals, nonoffice clericals, sales workers, craftsmen, operatives, service workers, and laborers. They found that dual economy theory implies a multidimensional array of concepts that are causally interrelated. Any attempt to portray the complexities of these processes with a single measure is likely to be incomplete. Further, their findings indicate that the utility of variables such as concentration, firm size, scale, and the role of the state might prove useful for studies of individual achievement, as supplements for other positional variables such as occupation and class.

In an attempt to analyze the relation between industrial segmentation and men’s intergenerational occupational mobility, Tolbert (1983) uses data from

III. LITERATURE: SEGMENTATION STUDIES
Occupational Changes in a Generation as an adjunct to the US Bureau of the Census’ Current Population Survey in March 1973. Tolbert collapses the 17 occupational categories first used by Blau and Duncan (1967) into eight classes without introducing substantial within-category heterogeneity in mobility patterns. Then these eight occupational categories are subdivided by industrial sectors with Tolbert et al.’s (1980) dual-sector scheme (core and periphery). Tolbert finds that of those who have moved from their fathers’ sector, nearly two-thirds have moved from competitive (periphery) sector into the oligopolistic (core) sector. He also finds that a tendency for mobility patterns to be more similar within professionals, other white collar, and blue collar occupational groups rather than between them. The same tendency is found within rather than between core and periphery industrial sectors. Tolbert (1983) claims that these findings support hypotheses which posit the existence of sectoral constraints on mobility patterns.

In an attempt to investigate aggregate-level evidence regarding the nature of labor market mechanisms that generate earnings inequality among individuals, Sakamoto (1988) considers both factors of industrial segmentation and occupational power. Sakamoto collapses Hodson’s (1983) sixteen sector scheme into nine sectors, adds two new sectors--Armed Forces and Government--that Hodson does not consider, and then crossclassifies each individual of each industrial sector into one of four occupational segments: (1) Professional; (2) managerial; (3) high-skilled worker; and (4) low-skilled worker. In doing so, he obtains a total of forty-one industry-by-

III. LITERATURE: SEGMENTATION STUDIES
occupation segments.\textsuperscript{12} Based on the regression analyses of earnings inequality across 282 Standard Metropolitan Statistical Areas (SMSAs), Sakamoto claims that evidence supports neither structuralist theory, at least as operationalized this way, nor human capital theory. The results vary substantially depending on the particular measure of inequality. Sakamoto (1988:104) explains that there might be substantial internal heterogeneity across metropolitan areas. Furthermore, as suggested by some authors (e.g. Baron and Bielby 1980), firms might be a better unit of analysis in delineation of labor market segments than the SMSAs.

Sakamoto and Chen (1991a) estimate models of wage determination and sector attainment for a cohort of young men in a dual labor market framework, using data from the matched March-May, 1979 Current Population Survey. The authors use several indicators of workers’ bargaining power to define primary-sector workers who were employed in any of the following categories: 1) professional or managerial occupations (based on the 1970 census codes); 2) the oligopolistic or core industrial groups as defined by Hodson (1983); 3) establishments with 1,000 or more workers; or 4) jobs that were covered by union contracts. The secondary sector is defined as all private-sector workers who are not included in any of the above four categories. As we see, although the authors (1991a:298) argue that occupation-based division of labor market segments have better explanatory power than the industry-based division,

\textsuperscript{12} The author does not differentiate occupations in the armed forces and consequently it ends up with forty-one occupational segments instead of forty-four.

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they still use Hodson’s (1983) classification for the core sector of industrial
segmentation as one of their criteria to divide their labor market segments. Contrary
to the evidence from most previous studies as well as to the dual labor market theory,
Sakamoto and Chen (1991a) find that returns to schooling are the same in each sector.
The authors argue that it is because of union in the primary sector which suppresses
the differentiating effect of schooling. Following the study by Dickens and Lang
(1985), Sakamoto and Chen also tested the queuing and rationing hypothesis. Their
evidence supports the hypothesis for existence of the queuing and rationing process in
the segmented labor market.

Labor market segmentation research has recently seen a shift from the
discrete, unidimensional/dualistic approach to the continuous, multidimensional
conceptualization. This trend is also reflected in the effort of cross-cutting
occupational segmentation by industrial segmentation. In this respect, Smith and
Noma (1985) use centroid scaling to analyze a 79 by 79 mobility matrix of
intercollegiate athletic personnel. In contrast to the typical conceptualization of labor
market segmentation, which implicitly claims that each segment be characterized by a
distinct cluster with large gaps with other segments, Smith and Noma’s (1985)
findings suggest a rather complex structure of both distinct market segments and

13 Queuing and rationing refers to the assumed phenomenon that because supply is
always greater than demand for the primary sector jobs, potential workers must wait
for primary-sector employment and thus a queue develops (Dickens and Lang 1985);
the employers rank persons according to their quality and then "choose the 'best'
from the queue" (Lang and Dickens 1985:76).

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segments produced by overlapping factors. They conclude that the labor market segments are continua in a multidimensional structure.

III.5. The Dynamics of Labor Market Segmentation

There is relatively little literature about the impact of the dynamics of labor market segmentation on labor market experience and labor market outcomes. Much of it implies that the dynamics of labor market segmentation are closely associated with, and more or less reflect the cyclical movement of the economy. For instance, summarizing the literature, Rosenberg (1989:386) notes:

Several, but not all, of the dynamic theories of labor market segmentation argue that some workers in the secondary labor market (or lower-tier positions) will move to primary sector jobs (or upper-tier positions) during cyclical upturns, while a recession increases the likelihood of downward occupational mobility from primary (or upper-tier positions) to secondary jobs (or lower-tier positions). These labor force flows will be accompanied by changes in hiring rules and procedures. Furthermore, the existence of labor market segmentation implies that primary market workers who lose their jobs and are forced into secondary positions will suffer substantial cuts in pay and, perhaps, job stability.

Rosenberg (1989) also points out that virtually all these research is based on the data of a period between 1965-1970 when there was a tight labor market. Thus, unsurprisingly they have found a lot of upward mobility. But the data did not allow them to report whether such upward mobility is temporary and whether workers have returned to the secondary labor market during the serious economic recession of the mid-1970s. Given the data limitations, for instance, Vroman (1978) could only

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suggest, instead of definitively showing, that many who advanced along the occupational structure during the late 1960s lost their positions and moved back to lower-paying ones during the mild cyclical downturn of 1969-71.


Although a lot of work (e.g. Podgursky and Swaim, 1987a; 1987b; Mishel and Podgursky 1988, etc.) on displaced workers did not explicitly use labor market segmentation theory, they did suggest that many people displaced from positions, which would be defined as subordinate primary positions, received substantially lower wages on their new jobs, if they were lucky enough to find jobs. The older male blue-collar worker with little formal education, who earned relatively high rates of pay on his former job and had held that position for an extended period of time had harder time to locate new positions. In addition, Black displaced workers had more difficulty finding new positions than white. In their case study of closure of International Harvester Corporation truck operations in Fort Wayne, Indiana, Ashton and Iadicola (1989) divide that displaced workers into three groups: Salaried/technical employees,

III. LITERATURE: SEGMENTATION STUDIES
factory employees, and managerial employees. Contrary to the previous research findings, they find that factory (blue-collar) employees were likely to experience less income loss than managerial and salaried/technical (white collar) employees. However, they also find that the reemployment in the manufacturing sector was important in reducing income loss only for the white-collar workers and age factor is more important for the blue collar workers to find employment than for the other two groups. A study of closure of four plants in the Jell-O division of General Foods Corporation by Lipsky (1970) also finds that age is a negative factor for reemployment of the displaced workers, while education is a positive factor and being female indicates longer duration of unemployment. Analysis of data from the CPS Displaced Workers Supplements January 1984 by Cappelli (1992) shows that on the one hand, managers in the mid-1980s were actually more vulnerable to displacement than were other employees, suffering proportionately greater job loss from the downsize organization and plant closing, and on the other hand managers are less likely to report increase in weekly earnings after being reemployed than other white collar and blue collar employees. However, none of these studies explicitly utilized the notion of segmentation.

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14 Factory employees included the skilled trades and assemblers; Salaried/technical employees were non-exempt white-collar workers. Their jobs range from shipping clerk to parts scheduler to blueprint specifications interpreter. The managerial group included people from line foremen up through industrial engineers to plant managers (Ashton and Iadicola 1989:123).

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Virtually all of the previously discussed American studies of labor market segmentation were based on the 1965-75 time period. The fact is that there were very tight labor markets in the 1960s. To protect their work force, firms, especially big firms, took internal labor market measures such as higher-than-market wages, job ladders, tolerance of labor unions, medical insurance and retirement plans. As a consequence, clear and rigid segmental lines could be seen between good jobs and bad jobs, big firms and small firms. Entrance of different labor market segments and mobility between were big topics in labor market segmentation research. However, economic conditions have worsened since the mid-1970s, resulting in restructuring of the labor market—a process characterized with abandonment of the internal labor market measures and adoption of the flexible and competitive external labor market measures. As discussed in Chapter II, Rosenberg (1989) conceptualizes three types of flexibility: wage flexibility, employment flexibility, and functional flexibility. Regarding the employment flexibility, for instance, Appelbaum (1987) finds evidence that employers are restricting the size of the core work force and expanding the peripheral work force with part-time and temporary employees with skills readily available. With this practice, the bipolarized core/peripheral structure is actually being institutionalized inside the firms. Belous (1989) finds that "contingent" labor force—composed of temporary workers, part-time workers, self-employed workers and business service workers—has grown at a substantially faster rate than the entire labor force in the 1980s in the United States. In response to product market competition and

III. LITERATURE: SEGMENTATION STUDIES
uncertainty of product demand, Atkinson (1987) argues that the "flexible firm"--a notion corresponding to the concept of Rosenberg's functional flexibility--are emerging. It refers to the firms that are seeking a wider range for subcontracting. It is very similar to what Robert Reich (1991) has described: Firms of this kind are spinning out to reproduce contracting relationships in order to knit a web, which has the flexibility to produce a variety of goods, swiftly respond to the changes of product demand, as well as promptly meet with the technological changes. This tendency makes more and more workers with skills, even professionals, become peripheral. The inevitable consequence of this tendency is that labor becomes increasingly liable for a larger share of the cost of economic flux and uncertainty than ever before. In short, this trend should be considered as a new twist of the development of labor market segmentation instead of the end of it.

III.6. Summary

In general, the literature supports the existence of labor market segments in the U.S. economy as hypothesized by the segmentation theories. Theoretically, most researchers seem to agree on the core-periphery division of industrial segmentation, and a primary-secondary division of labor market segmentation, with a pivotally discrete upper-tier (independent) and lower-tier (subordinate) distinction in the primary segment, regardless of a large variety of operationalization schemes. The literature reviewed also confirms the existence of the distinct impact of industrial and

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labor market segmentation independent of the effect of human capital factors on people's socioeconomic outcomes. In sum, consistent with the theory, the literature suggests that returns to formal education and experiences are greater for the workers in the primary/core segments than for those in the secondary/periphery segments; with regard to the mechanisms of occupational mobility in the segmented labor market, there exists the queuing and rationing processes for the entrance of primary/core segments, which are racially, sexually and occupationally selective. There is much less research on the dynamics of industrial and labor market segmentation during the turbulence of American economy of the past two decades and their effects on people's labor market experiences and outcomes, let alone the specific population group such as displaced workers. However, the recent literature shows that there appears a trend that the clear segmentation of labor markets and industries is giving way to flexible and diverse segmentation in response to the restructuring of the economy.

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CHAPTER IV

LITERATURE REVIEW: DISPLACEMENT AND MIGRATION

OUTCOME STUDIES

IV.1. Introduction

This chapter touches upon two major topics of literature relevant to the present thesis: 1) The relationship between the labor market dynamics and the consequences of displacement and lay-offs. Under this topic, I mainly focus on the impact of industrial structure changes and labor market conditions on the displaced workers’ post-displacement labor market experiences and outcomes. 2) The impact of labor migration on income and employment status. Under this topic, I discuss the literature on outcomes of migration for the individuals at large instead of displaced workers in particular since there is little literature on migration of displaced workers. Assuming that there are some similarities between migrants of the general population and migrants among the displaced workers, regardless of its possible limitation in relevance, the current study will gain extra insight if the difference is found between the migrants of general population and migrants of displaced workers.

IV.2. The Dynamics of Labor Market and the Losses of the Displaced Workers

IV.2.1. Industrial structure changes and local/regional labor market conditions

Analyzing the data from the January 1984 CPS Displaced Workers
Supplements, Howland (1988) shows that workers displaced in local markets with a growing demand for labor experienced shorter unemployment spells and smaller wage losses than the displaced workers in weak labor markets, in spite of the fact that most displaced workers still experienced some financial loss. Using the same data combined with a set of local labor market variables drawn from other data sources—such as annual average changes in total employment, in manufacturing employment, in the employment of displaced worker’s previous industries, as well as in mean unemployment rate and in local unemployment rate, and the year laid off—Howland and Peterson (1988) found that the reemployment success of displaced blue-collar workers is influenced by local employment growth in the worker’s industry of displacement, whereas for the white-collar workers a more influential factor was employment growth and labor supply in all industries. This may suggest that job search is more industry-specific for blue-collar workers than for white-collar workers because the skills of white-collar workers are more transferable between industries.

Podgursky and Swaim (1987a), also using data from the January 1984 CPS Displaced Workers Supplement, included, among other things, SMSA unemployment rate and found it having a significant positive effect on the duration of unemployment for all categories of workers except blue-collar women. Jenkins and Montmarquette’s (1979) study of displaced workers from Canadian aircraft industry, between January, 1972 and March, 1975, also found that the unemployment rate in the general labor

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market at the time the workers were unemployed also had a significant impact on the amount of the loss of private income for all groups of displaced workers.

Although he did not focus on the displaced workers, DiPrete (1993) studied the impact of contraction and expansion of industries on the worker’s external mobility and internal mobility as well. Very relevant to the present thesis, DiPrete notes that large organizations did a better job of protecting their work force, but these effects appeared to be of limited importance during the 1980s. He found that service and blue-collar workers are sensitive to changes in industry size. During the contraction of an industry they are more likely to move to other industries presumably in response to the layoffs and declining opportunities in the home industry (DiPrete 1993:89). DiPrete concluded that labor market turbulence had its biggest impact on low-level workers in the job hierarchy whereas white-collar workers, especially upper white-collar workers, were least affected by the economic turbulence.

A more comprehensive study of the impact of structural changes on job mobility was done by Carroll and Mayer (1986). They identified three aspects of structural changes such as in organizational size, social class, and industrial segmentation. Large differences by social class in the overall rate of job change are found. The professional class exhibits the lowest rate of job change followed by owners, civil servants, managers, white-collar employees, and finally, blue-collar employees. Although all social classes have a desire for upward mobility, in reality, white collar workers are considerably less likely to move downward, or to move

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across firms than are blue-collar workers. The social class variables always show strong negative effects on across-firm mobility. The authors concluded that this finding suggests that internal labor markets have powerful homogenizing effects in that all classes are promoted similarly as a consequence of the internal bureaucratic process of rationalization. The opposite is true in the external labor markets.

Some studies (Ruhm 1992; Swaim and Podgursky 1989) focusing on the effects of advance notice on the post-displacement labor market experiences of workers also controlled for aspects of labor market conditions, which are quite relevant to the present research. The dependent variables of these studies usually are reemployment and duration of post-displacement unemployment. For instance, in addition to the unemployment rate for the year of displacement, Ruhm (1992), in his analysis of the January 1984 CPS Displaced Workers Supplement data, incorporated a group of other labor market variables, such as state unionization rate, average annual growth rate of industrial employment in 19 industrial categories, average unemployment rate by occupational categories and unionization rate by 19 industrial categories. Among them, he found that displaced workers living in areas with a high unemployment rate had a longer duration of joblessness while those in areas of higher average annual growth rate of industry employment tend to have a shorter duration of joblessness (1992:18). Podgursky and Swaim (1987a) and Swaim and Podgursky (1989), using January 1984 CPS DWS, and January 1984 and January 1986 CPS DWS pooled data, respectively, also examined the effect of area unemployment rate

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at the time of displacement and unionization rate\textsuperscript{15} on the jobless duration following the displacement and found that across all groups of displaced workers, area unemployment rate had a consistently significant positive effect on the jobless duration, with blue-collar males being more sensitive. In both studies, industry unionization rate appeared to prolong the jobless duration for all groups.

In the study of the closing of International Harvester truck operations in Fort Wayne, Indiana, Ashton and Iadicola (1989:125) commented that the high level of unionization of International Harvester, together with their specific training and skills which were mostly obtained on the job, and had promoted internal labor market and protected the blue-collar workers, actually weakened their competitive power when suddenly exposed to the external labor markets.

Podgursky and Swaim (1987a) and Swaim and Podgursky (1989) found that unemployment benefit eligibility tends to prolong job search only for blue-collar males. The result from Seitchik and Zornitsky's (1989) study suggests that tenure is inversely related to reemployment, reflecting the difficulties that those with long-term stable attachments to a particular internal labor market have in finding new jobs.

The structural unemployment should account for the majority of prolonged joblessness following displacement. In their study, Podgursky and Swaim (1987a:224) cited Ehrenberg and Smith's (1985) definition of structural unemployment: "Workers

\textsuperscript{15} For the former study, the authors used industry unionization rate (from Freeman and Medoff 1979) while for the latter, they used percent of work force organized in 1980 (from Kokelemburg and Sockell 1985).

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are usually considered structurally unemployed if they experienced lengthy
unemployment as a result of a mismatch between supply and demand for particular
skills and local labor market." Podgursky and Swaim (1987a) argue that due to
structural changes of the labor market, most of the unemployment that the displaced
workers experienced may be classified as this type when they tried to avoid possible
downward mobility by spending longer search time for the jobs of their specialty.
Thus, occupational specific employment level rather than overall local unemployment
rate is probably more relevant to the displaced workers.

The notion of structural unemployment also leads us to consider structural
underemployment, which occurs when the displaced workers experience downward
occupational mobility, especially when their pre-displacement occupation-specific
skills become useless at their new jobs. As Hamermesh (1987) remarked, the costs of
adjusting to the labor market changes are largely the costs of the resources specific to
the abandoned activity. However, little research has been done regarding structural
unemployment and underemployment. It may be because operational distinction
between structural and nonstructural unemployment is hard to draw without the
appropriate questions being asked in the survey studies.16

16 For the future studies along this line, data about the structural unemployment
probably can be derived from the survey questions about whether the workers’ current
unemployment status is because they cannot find any kind of work or because they
cannot get a job within their previous occupation or related to their previous working
experience.

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IV.2.2. Occupational/industrial differentiation

The existing literature suggests that pre-displacement occupations and industries exert important effects on displaced workers’ post-displacement labor market experience. Seitchik and Zornitsky (1989) analyzed the 1986 CPS DWS data and found that when white-collar and blue-collared displaced workers become reemployed, they both earn less than their undisplaced counterparts with the same characteristics. They examined three key outcomes of interest: whether reemployed or not; whether reemployed in a growth sector or not; whether reemployed in a comparable-wage job or in a lower-wage job. They found that the probability of reemployment in a growth sector is more associated with one’s prior occupational and industry attachment rather than human capital variables (1989:97). Relative to service and white-collar workers, those from the manufacturing sector with blue-collar skills are substantially less likely to enter a growth sector of industry. Even in the growth states, displaced workers from the manufacturing sector are no more likely to become reemployed in a growth industry than they are in the sluggish areas. Seitchik and Zornitsky (1989:99) concluded that growth sectors have jobs for individuals with either limited or advanced education and experiences. They are less attractive or accessible to those from the declining industrial sector and thus the transition from declining to growing sectors can be quite difficult for many displaced blue-collar workers. They also found that earnings loss does diminish over time, which might suggest that earnings loss is transitory.

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Consistent with the above evidence, analysis of the 1984 CPS DWS data (Podgursky and Swaim 1987b) indicates that median earnings losses for workers who return to full-time work are modest as measured by the ratio of current to former earnings. Formal school education greatly reduced earnings losses for blue-collar, white-collar and service workers and also increased the likelihood of reemployment. In contrast, among the reemployed, those with more investments in specific human capital suffered larger and more enduring reemployment earnings losses. This finding suggests narrow vocational training in an internal market is risky and the external labor market of the growth sector tends to demand the labor supply with better general education and thus more flexibility.

Cappelli (1992), using longitudinal data from the overlap section of the sample of the January 1984 CPS and January 1986 CPS DWS, finds that contrary to the conventional wisdom, managerial personnel are even more vulnerable to displacement in recent years. Because of becoming less and less able to provide them with job security, organizations found it increasingly difficult to obtain loyalty from the managers. They tended to keep their attention on the opportunities in the external markets. Like other white-collar workers, however, displaced managers were more likely to be reemployed with considerably shorter period of unemployment, and less likely to withdraw from the labor force than blue-collar workers. Consistent evidence is found by Ashton and Iadicola (1989:124) in their International Harvester study. It shows that among the three categories of employees--factory, salaried/technical and

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managerial, managerial employees were the most successful being reemployed full-time in numeric terms, in contrast to the salaried/technical employees who were the least likely to be reemployed full-time and the most likely to be employed part-time at the survey. Among these three groups, the salaried/technical employees has the largest proportion (90%) that experienced income loss relative to 75% of the factory employees and 60% of the managerial employees.

IV.2.3. Reservation wages differentiation

Studies of displaced workers based on the job search perspective often use the concept of reservation wages, referring to expected wages from the jobs the individual displaced workers are searching for, which is largely derived from their pre-displacement wage level. With the introduction of this concept, examination of mere reemployment does not appear to make much sense without controlling for the direction of occupational mobility because some displaced workers have higher reservation wages and it takes them longer to locate work without lowering their reservation wages. In other words, from a job search perspective, reemployment can be of negative selection, i.e. those who have lower reservation wages were reemployed sooner than those who try to maintain their higher reservation wages because they tend to reject the early offers that do not meet with their reservation wages. According to this rationale, workers who had longer duration of joblessness probably had spent more time searching for a new jobs and thus were more likely to

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become reemployed at relatively high wages. The evidence, however, failed to support the hypothesis by showing that prolonged joblessness is associated with larger earnings losses upon reemployment, especially for the blue-collar men (Podgursky and Swaim 1986b cited in Podgursky and Swaim 1987b:26). This finding seems also supported by Ashton and Iadicola (1989:137), who find that for the workers, including both factory workers and salaried/technical workers, separated from the truck operations of International Harvester, the length of unemployment was an important factor predicting income loss (difference between the predisplacement and current incomes and difference between highest and current income), while for the managers its impact was negligible. Such evidence may suggest that longer search time due to the displaced workers’ higher reservation wages can hardly cancel out the effect of the changing labor market structure.

IV.2.4. Sex and race differentiation

Analysis of the National Longitudinal Survey (NLS) of young men and women by Blau and Kahn (1981) shows that among involuntary laid-off workers who obtained subsequent employment, white males are hurt more by layoffs than black males in terms of both short-term and long-term earnings growth; women’s earnings are not necessarily affected by layoff at all. However, Whites relative to Blacks and both Black and White males relative to the female counterparts are found to be more likely to be reemployed. In Ashton and Iadicola’s (1989:140) study of the shutdown case of
the International Harvester Corporation truck operations, the evidence indicates that with regard to the level of income loss, the differences between male and female salaried/technical employees are found to be greatest among those who were re-employed. This finding indicates the stronger effect of an internal labor market for female workers.

Although not entirely concentrating on the involuntary laid-off workers, Ruhm (1987) finds evidence from the PSID data of 1969-80 waves to show that men lost less from layoffs than women, and also men suffer a much smaller penalty than women for repeated job changes. The discrepancy of this result with that from the study by Blau and Kahn (1981) is probably due to different measurements of income loss.¹⁷

IV.2.5. Summary

This section of literature review highlights the evidence of the effects of industrial and labor market structural changes on labor market outcomes of displacement for the workers, such as income loss and duration of unemployment, from previous studies. In sum, most studies find the proportion of the displaced workers who suffered some degree of earnings losses either due to long duration of

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¹⁷ Ruhm (1987) notes that average relative changes in earnings of job stayers and job changers that most previous studies used are likely misleading. He argues that the emphasis should be on the variance in earnings changes rather than on the average changes between before-layoff and after-reemployment earnings of different groups of workers.

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unemployment and downward occupational mobility; industrial and labor market structural changes as well as cyclical expansion/contraction pattern of economy are all found responsible for these outcomes. More pivotal to the present study, outcome differentials are found among the displaced workers; pre-displacement occupations, industries, race and sex are found not without importance in determining these differentials. However, so far no studies have explicitly examined the impact of industrial and labor market segmentation on these differential outcomes.

IV.3. Effects of Migration on Individual Socioeconomic Outcomes

In comparison with the knowledge of determinants of migration, the empirical evidence about consequences of migration, at either aggregate level or individual level, is scarce (Greenwood 1975), let alone that of migration of the displaced workers. Some studies have been done on the relocation of workers as part of the strategy of capital and plant movement. Displaced workers who were recalled by the employers to relocate to the new site of the operations are highly selective and in general reported outcomes are usually positive. A recent case study of the relocation of a group of laid-off high-seniority blue-collar workers from the shutdown of the Acme plant, in the Midwest, to a new operation site in a Southern state, indicates the outcomes are complex and vary for different workers in terms of race and sex (Kaufman, 1989).

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This section of the literature review consists of two parts: (1) migration effects on income differentials; (2) migration effects on employment status.

**IV.3.1. Migration effects on income**

In the early studies of major migration flows in the United States, researchers (Lansing and Morgan 1967; Master 1972; Wertheimer 1970) find that the income gains from migration depended on the directions of migration. Migrants from the Deep South to North and from rural to urban tended to have higher income gains than nonmigrants, while migrants of other directions or from urban to rural tended to have lower income gains than nonmigrants. Women migrants were always worse-off in comparison with their pre-migration economic status regardless of migration direction. However, a recent study using the 1980 United States Census Public Use Microdata Sample by Krieg (1990) investigated the role of migration in determination of the earnings differentials by race and gender and found that functions of interstate migration decreased earnings differentials significantly for both nonwhite males and nonwhite females. Krieg (1990:220) claims that these relative gains are not due to varying degrees of human capital accumulation, but rather are due to a lessening of unexplained differentials in destination region. In other words, migrants tend to chose the destinations with the similar standards. A disappointment hypothesis based on the similar neo-classic rationale was examined by Grant and Vanderkamp (1985, 1986),
who argue that people will resort either to onward-move or to return-move if their initial move did not result in optimal economic outcomes.

Some researchers, however, believe that a distinction between types of migrants should be made in order to explain the differentials in earnings outcomes among migrants. Masters (1972) and Antel (1980) made efforts to distinguish between recent migrants and life-time migrants and found that income was only higher for the life-time migrants who moved from the South or from rural areas, but not for the recent migrants. However, the weaknesses of classification of migrants into recent and life-time migrants from the duration at the present residence is its failure to take into account of repeat migration. Yezer and Thurston (1976) point out that the selection of life-time migrants could result in upward bias of income gains because it leaves out the unsuccessful repeat migrants. By incorporating intra-regional migration in the North into their model, Yezer and Thurston find that the differences between 'recent' and 'life-time' migrants from other regions to the North were less distinct than they were in earlier studies. Another important finding by Yezer and Thurston (1976) was that nonwhite migrants, whether 'recent' or 'life-time' migrants, had higher incomes than the nonmigrant counterparts whereas no such evidence is found between the white migrants and stayers.

Farber (1983) finds that white men’s post-migration earnings growth was more rapid than that of nonmigrant white men and also income growth for migrants increased with the time spent at the destination. Gallaway (1969) finds that migrants

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had higher earnings than stayers regardless of whether or not they changed their industry, and concludes that migration paid but industry change did not. But Gallaway fails to control for individual characteristics other than age and only compared across the end-of-interval earnings without controlling for initial earnings apparently by assuming the identical beginning income and identical potential for earnings growth. In a follow-up study, Cox (1971) reexamines the claim by Gallaway and finds that both migration and industrial change were associated with higher incomes, and industrial change with even greater income growth than migration.

Findings about the income returns to migration from the panel data are mixed and inconclusive. The panel study by Lansing and Mueller (1967) covers only a period of two consecutive years and uses income at the end of the interval without controlling for initial income. Consequently they compare income levels of migrants and stayers but not income changes and conclude that there was no difference in income level between the movers and non-movers at the end of the interval. The apparent weakness is that without the knowledge of the initial income we are not certain whether this lack of a difference is because of migration or not. Comparing between the long- and short-distance movers in a relatively long period time (6 years), Polacheck and Horvath (1970) find that long-distance movers indeed increased their earnings. Grant and Vanderkamp’s (1980) study, using a Canadian panel sample covering a period of six years, finds a positive distance effect on income gains. They find that payoffs were higher for single men and workers with lower initial income.

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Sandell (1977) and Hunt and Kau (1985) find that repeat moves induced higher payoff in earnings.

Evidence is also found by Sandell (1977) that a positive effect of migration on earnings will show up after a delay period of four years. This effect of delayed return was supported by the evidence by a large number of studies with longitudinal data (Placheck and Horvath 1970; Sandell 1977; Grant and Vanderkamp 1980; Hunt and Kau 1985).

Some studies focus on the interactive effects of job mobility and geographic mobility on changes in earnings. Sandell (1977) find that migration due to inter-firm transfers had the strongest positive effect on income. Bartel (1979) also find that workers who transferred or quit tended to gain from migration while laid-off workers tended to lose from migration. The study by DaVanzo and Hosek (1981) finds that income was unaffected by migration when the employment status (quits, layoffs and tenure) was controlled. Similar evidence (Love and Torrence 1989) was found from the January 1984 CPS Displaced Workers Supplements, which suggests that for the displaced workers who were reemployed whether relocated or not actually does not make a difference on their earnings. This obviously leaves us a question unanswered. That is, from this result we do not know whether migration does not make a difference to the earnings regardless of workers' occupational and industrial characteristics or just for workers with some specific labor market attributes. Some studies tried to take into account the local labor market conditions as well as

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individual attributes. For instance, Harris (1981) looked at some of these variables in his study. He demonstrated that higher income gains of migrants diminished at the end of the 5-year period of investigation when controls for migrants’ selective attributes such as education, occupation, income and change in opportunity structure (labor market size, unemployment rate, wage rate of localities) were introduced. Empirical evidence from Rohr-Zanker’s (1990) research on migration based on labor market segmentation theory using PSID data is complex in terms of income gains. In general, income for disadvantaged workers increased immediately after a move. This is true also for the other groups. Over the extended period, migration effects varied by social groupings, and for several groups, stayers had larger growth rates than migrants. Overall, both economically disadvantaged and economically advantaged migrants enjoyed immediate positive income effects, but only advantaged migrants were able to maintain their relative advantageous position for an extended period. Rohr-Zanker also found that transitional (equivalent to the lower-tier primary segment) migrants tended to be worse off than stayers immediately after the move. This finding may suggest that it is more difficult for the transitional workers to find jobs comparable to their previous jobs in pay.

With data from the 1973-1977 U.S. Annual Housing Surveys, Sell (1983) attempts to derive implications about the existence of nonmarket forces in labor relocation as described by dual labor market theory. The finding indicates that job relocations including both job transfer and market-induced migration are

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overrepresented among the primary job holders. Income attainment is higher for the former than for the latter. However, Sell (1983:103) notes that given the increasing frequency of occupational relocations on the one hand, and declining of the American economic paramount position on the other, the benefits expected by both job-transfer migrants and market-induced migrants may be getting more and more difficult to realize.

IV.3.2. Migration effects on employment status

The analyses of the aggregate CPS data from 1984, 1986 and 1988 Displaced Workers Supplements (DWS) (Flaim and Sehgal 1985; Horvath 1987; Herz 1990) all indicate that movers are more likely to be re-employed than nonmovers among the displaced workers. However, few studies document migration-related change of employment status. Lansing and Mueller (1967) found from their longitudinal data that about 70% of those unemployed before relocation had quickly found a job at the new location. However, the authors do not compare the proportion with nonmover, nor do they control for worker’s skill levels. Sandefur and Tuma (1987) find strong positive relationship between pre-migration unemployment and migration, whereas such relationship is not found between migration and post-migration unemployment. From this finding, they conclude that migration changed the unemployment status for many workers.

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In contrast, Herzog and Schlottmann (1984) argue that migration does not necessarily secure employment. Using the 1970 Census microdata, they looked at both the effects of occupational status and labor market conditions such as growth rate of employment, total nonagricultural employment and unemployment rate on the unemployment of migrants and nonmigrants. They supported their argument with the evidence that unemployment rates among white male migrants (except for the professional and technical occupations) exceeded that of stayers both before and after migration, while controlling for race, for the blue-collar workers migration and repeat migration tend to increase the likelihood of post-migration unemployment. The multivariate analyses of the Public Use Microdata Samples of the 1980 decennial census by Wilson and Tienda (1989) reveal that migration did not increase the likelihood of being reemployed among the native-born minority population, especially black, Mexican, and Puerto Rican men compared to the foreign-born minorities. Their interpretation of this finding is that the foreign-born minority migrants may be more willing to accept marginal or low-wage jobs than the native-born minority migrants, due to lack of alternative means to support themselves and also because these opportunities are relatively better than those available in their places of origin.

However, due to the inadequate control for social class, occupational status, labor market attributes, and labor market conditions, it is far too hasty to draw the conclusion that migration has positive effects on the chance of reemployment for the unemployed workers at large. Empirical evidence from Rohr-Zanker's (1990) research

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on migration outcomes based on labor market segmentation theory casts more doubt on this neo-classical assumption. In terms of employment status, her evidence indicates that migration did not significantly improve the employment situation for the workers, who were unemployed or had a record of unstable employment, and young, nonwhite male, and poorly educated, i.e., the disadvantaged. She concluded that unemployment does not appear to be simply the result of being at the wrong location at the wrong time, which can be easily solved by migration.

Some of the recent studies focusing on the effects of advance notice on unemployment duration based on the data of CPS Displaced Workers Supplements also incorporated migration variables in their models. With the data of the January 1984 CPS Displaced Workers Supplement, Addison (1989) examined the determinants of duration of unemployment by comparing across the reasons of displacement, i.e., displaced because of a plant closing or because of slack work, abolition of shift or position. He found that movers among the workers displaced because of plant closings have longer duration of unemployment than movers among the workers displaced due to slack work and abolition of shift or position. With the same dataset, Love and Torrence (1989) and Addison and Portugal (1987) found that relocation has a negative effect on weeks without work when not controlling for the reasons of being displaced.

IV.3.3. Summary
Research on migration outcomes in terms of earnings and employment status are inconclusive and their results are complex and hard to generalize. The review indicates the migration outcomes differentiate across the types of migration and the types of migrants and across times as well. However, the early research on migration consequences is hardly following along the social class lines thanks to the domination of human capital theory in this area. Thus our knowledge about migration outcome differentials across occupation, race, gender and class as well as industrial and labor market structural variables is poor. Overall, the literature reviewed in this chapter failed to look into the economic outcomes of migration interrelated with the structural differentials imposed on individual migrants, except for very few studies (e.g. Sell 1983; Rohr-Zanker 1990). In addition, the previous studies of migration outcomes largely focus on whether migration incurs economic gains or not based on the underlying neo-classical assumption about the rationality of human beings. Based on the literature about the losses incurred by displacement, I believe that studies of migration outcomes of displaced workers in the context of deindustrialization, in contrast, should concentrate on whether migration alleviates the losses or not.

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V.1. Formation of the Conceptual Models

Based on the theoretical framework and hypotheses in Chapter II and literature reviewed in Chapters III and IV, I develop two conceptual models. The first model postulates that differentiation in earnings loss for the displaced workers is a function of economic segmentation, which includes labor market segmentation as well as industrial segmentation, interaction between labor market segmentation and geographic mobility, occupational and industrial mobility, and socio-economic and demographic attributes of the displaced manufacturing workers. This model can be formally expressed as follows:

\[ \text{Earnloss} = f(\text{Seg, Mig, Mig}*\text{Seg, Mobil, Soc-econ, Demog, Cont e}); \]

where \( \text{Earnloss} \) on the left side of the equation refers to the measures of earnings losses; on the right side of the equation, \( \text{Seg} \) refers to the labor market segmentation and industrial segmentation variables—to which individual displaced workers belong and from which they were displaced; the incorporation of both of these variables based on the argument that they should have independent impact on the earnings loss of the displaced workers; \( \text{Mig} \) means migration status; \( \text{Mig}*\text{Seg} \) refers to both the interaction between migration status and labor market segmentation and the interaction between migration status and industrial segmentation; \( \text{Mobil} \) refers to the workers’
occupational and industrial mobility between their pre- and post-displacement jobs; 
*Soc-econ* includes the variables such as race, gender, education, work tenure, 
previous earnings level and marital status; *Demog* refers to age variables; *Cont* refers 
to the controls that do not belong to any of the above categories but are so important 
that without them the models could be misspecified. They include the advanced 
knowledge of displacement, the year when the worker was displaced, hours the 
worker worked during the survey week, and weeks without work following 
displacement.

The previous literature indicates that another major form of loss due to 
displacement is the loss of work time. The relevance of lost work time to the present 
research topic lies in the fact that the loss of work time can be translated into 
monetary term. In other words, the work time lost is the income lost for the displaced 
workers. The longer the spell the displaced worker had without work following 
displacement, the more income loss he/she would suffer. This type of earnings loss is 
not embedded in the above earnings loss variables. Therefore, the present study 
conceptualizes a jobless duration model, which postulates that *differentiation in 
duration of joblessness for the displaced workers is a function of economic 
segmentation, which includes labor market segmentation as well as industrial 
segmentation, interaction between labor market segmentation and geographic 
mobility, and socio-economic and demographic factors*. This model can be formally 
expressed as follows:

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Duration = f (Seg, Mig, Mig*Seg, Soc-econ, Demog, Cont, e);

where Duration on the left side of the equation refers to the jobless duration following
displacement, which is one of the independent variables in the Earnloss models; the
variables on the right side of the equation are basically the same as in the Earnloss
models. However, note that three factors included in the Earnings Loss models are
not included in the current model. They are hours that the worker worked during the
survey week, occupational and industrial mobility variables, because the hours the
worker worked and occupational and industrial mobility cannot be predictors or
causes of the duration of unemployment in proper time sequence. In other words, the
workers had the working hours only after they ended their unemployment spell and
were reemployed. Similarly occupational and industrial mobility could only occur
when the displaced workers were reemployed and jobless spells ended. Therefore, the
causal relationship cannot be established for these variables in the jobless duration
model.

V.2. Data

This study explores the existing five waves of data from the Current
Population Survey Displaced Workers Supplements (CPSDWS or DWS will be used
from now on), which are January 1984, January 1986, January 1988, January 1990
and January 1992. I select CPSDWS data based on its essential qualities for study of
displacement, which can be summarized as follows:

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1) The CPSDWS enables the current study to precisely operationalize the concept of displacement according to the deindustrialization theory. This is the utmost advantageous quality of the CPSDW over any other existing data for displacement studies.

2) The CPSDWS permits classification of labor market and industrial segments with the standardized census occupational and industrial classification codes.

3) The CPSDWS provides information about whether the respondent moved after displacement to look for work or to take another job. The question about migration is unique in comparison with many other surveys commonly used for migration studies because it focuses on the job-related and job-search-related migration. Thus, it separates moves of other nature from the post-displacement employment-related migration.

4) The CPSDWS data allow us to calculate earnings loss by comparing between pre- and post-displacement earnings.

5) With the 3-digit detailed census occupational and industrial codes for both pre- and post-displacement jobs, the CPSDWS data facilitate exploration of the effects of post-displacement occupational and industrial changes on the earnings loss.

6) The CPSDWS is rich in information about the socio-economic and demographic variables which are necessary for studies of labor market segmentation and labor migration.

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The Current Population Survey (CPS) is the source of the official Government statistics on employment and unemployment. The CPS selects its samples from the civilian noninstitutionalized population of the United States by area of residence to represent the nation as a whole, individual states, and other specified areas. Each household is interviewed once a month for four consecutive months one year, and again for the corresponding period a year later. The samples for 1984, 1986 and 1988 are located in 629 sample areas comprising 1,148 counties and independent cities with coverage in every state and in the District of Columbia. And the samples for 1990 and 1992 are located in 729 sample areas comprising 1,973 counties and independent cities with coverage in every State and in the District of Columbia. In the 1984, 1986 and 1988 surveys, a sample of some 71,000 housing units or other living quarters was selected to be interviewed each month. Out of this sample, about 58,000 containing approximately 122,000 persons 14 years old and over were interviewed. In the 1990 and 1992 surveys, samples of some 71,000 housing units or other living quarters were assigned for interview each month, of which about 57,000 of them containing approximately 114,500 persons 15 years old and over were interviewed.  

Since January 1984, the Bureau of Census has been attaching the supplementary questions about the displaced workers to the regular January CPS

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18 A more detailed explanation regarding the CPS sample design and survey procedures as well as accuracy of estimates and sampling errors is provided in Technical Paper 40, *The Current Population Survey; Design and Methodology* (Bureau of Census, 1978).

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questionnaires every other year. The purpose of these supplementary surveys is to obtain information on the number and characteristics of workers 20 years of age and over, who had been displaced from their jobs due to operating decisions of a firm, plant, or business within the last five years from the survey date. Data are collected on reasons for job displacement, industry and occupation of both the former and present jobs, job tenure, and weekly earnings before displacement and after displacement. Additional information pivotal to the present study includes whether the displaced workers have moved to another area to seek work or to take a job and duration of unemployment.

Such efforts have resulted in five waves of data by 1992, which are the surveys of January 1984, January 1986, January 1988, January 1990 and January 1992. They contain retrospective data on the workers displaced during the periods between 1979 and 1983, between 1981 and 1985, between 1983 and 1987, between 1985 and 1989 and between 1987 and 1992, respectively. Instead of only examining one of these five waves of data like most of previous research in this area, the current research explores all five waves of data for the following three objectives:

1) In order to find the weak effects of some predictors for the earnings losses and jobless duration, which the individual waves of data may be unable to do due to the sample size constraint, it is necessary to increase the sample size by pooling the data from all five waves of data in addition to the analysis of each wave separately.

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The pooled data increase our confidence about the strength differentials of the causal relationships from the analyses.

2) The current study attempts to separate the effect of short-term economic cycles from that of the secular trend of deindustrialization. The pooled data from the five surveys cover a period of 12 years (1979-1991), which has seen two major economic recessions. The first occurred during the period of 1981-1983, and the second struck during the period of 1990-1991. The pooled data and the knowledge about the recessions allow us as well as make it necessary to look at their independent effects on the losses of the displaced workers.

3) A comparison across the five surveys may provide us with an overall picture of earnings loss situation of the displaced workers over the last decade. It will also enable us to examine the time specific variation in the models across the five waves of data.

V.3. The Operational Definition of Displaced Workers

To operationalize the definition of displaced workers, I follow the previous literature and impose the following scope conditions on the samples of displaced workers for this study: Workers--a) of 20 years of age and over; b) lost their full-time jobs involuntarily, because of plant closings or moving, slack of work or position abolition over the past five-year period; c) had worked on the lost job for at least two

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years before displacement; d) were still in the labor force, i.e., either working or looking for jobs—are included in the samples.19

Based on the theoretical framework of this study, manufacturing industries are of greater theoretical relevance than any other industries to deindustrialization. Thus, I restrict the samples to the workers displaced from the manufacturing industries.20

V.4. Assigning Labor Market Segments and Industrial Segments

Assigning the labor market segments: One of the two key variables of the conceptual models developed in the first section of this chapter is labor market segmentation. The literature reviewed about the assignment of labor market segments shows that there has been no satisfactory way of assigning labor market and industrial segments. In respect of assigning labor market segments, a comparison across the recognized labor market segment assignment schemes shows that Osterman’s eyeballing method (1975) of assigning 3-digit census occupational codes into either primary sector—either upper tier or lower tier—or the secondary sector is crude and

19 Since earnings loss and jobless duration as defined in this study are only relevant to the workers who were still in the labor force, I omit all those who have left labor force (either going to school, or keeping house, or being retired or unable to work).

20 The workers displaced from manufacturing industries with the 1980 census 3-digit industrial codes ranging from 100 to 392 were selected, including both durable goods manufacturing industries, and nondurable goods manufacturing industries.

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subjective relative to Rosenberg’s (1980) and Rumberger and Carnoy’s (1980). The latter are based on the DOT scores of occupational characteristics such as level of autonomy, skills, relationship with people and things, general educational level, and required on-job-training specific vocational preparation time. Rosenberg’s (1980) scheme is based on the calculated probabilities for each of the 3-digit 1960 Census occupations of belonging to a segment. This method appears more objective than Osterman’s eyeballing method. It, however, does not distinguish between the upper and lower-tiers in the primary segment, which is critical for the present research. Rumberger and Carnoy’s (1980) labor market segment assignment scheme divides labor market into primary independent, primary subordinate, craft and secondary based on DOT scores on two major variables: Specific Vocational Preparation (SVP) and Relationship with People (RP). Preference is given to Rumberger and Carnoy’s scheme over Rosenberg’s for the current study is because the former differentiates between primary subordinate and primary independent segments.

Rumberger and Carnoy’s scheme uses the DOT scores for the 1970 Census detailed occupational categories, whereas the 1980s’ CPS which the present study uses adopts the 1980 Census detailed occupational categories. They are substantially different. To adapt the data for the use of Rumberger and Carnoy’s scheme, I use Paula England’s (1993) updated DOT measures for 1980 Census detailed occupational categories. I assign the occupations to the three labor market segments instead of four

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as Rumberger and Carnoy’s (1980) original scheme. The scheme uses the variable of Specific Vocational Preparation (SVP)—nine categories—and Relationship to People (PEOPLE)—nine categories—with which to divide people into the secondary, primary subordinate, and primary independent sectors. The categories and their scores for these two indexes are listed in Table 5-1. Primary subordinate jobs were defined as SVP equal to 3, 4 or 5, referring to the average training time more than 30 days and up to one year required for the job, and RP equal to helping or serving, and SVP equal to 6, 7 or 8, referring to the average required training time over one year and up to 10 years and RP equal to helping. Primary independent jobs were defined as those with SVP equal to 6 through 9, which are equivalent to the required training time over 1 year and up to 10 years over, and RP equal to serving, or supervising.

21 As discussed in the literature review, Rumberger and Carnoy (1980) divide labor market into four segments instead of three by adding a "Craft" segment, which refers to occupations such as brickmasons and dancers, to the more conventional three sector segmentation scheme. It is apparently not quite applicable to the manufacturing industries.

22 In the fourth edition of the Dictionary of Occupational Titles (DOT), this variable actually has nine categories (Miller et al. 1980:22). An examination of England’s (1993) scale confirms this DOT categorization. Thus in Rumberger and Carnoy’s scale, ’no classification’ actually refers to those not specified in their five-category scale, which are "mentoring, negotiating, diverting, persuading, and speaking-signaling."

23 Rumberger and Carnoy (1980) did not use DOT General Education Development (GED) as one of the criteria for classification of labor market segment because they included education attainment level in their model to examine its independent effect. This reason is regarded as legitimate also for the current study.

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instructing, or mentoring, or negotiating. Secondary segment occupations are defined as those with SVP equal to 1 or 2, equivalent to minimum required training time, and RP equal to helping or serving (1980:131). The result is presented in Appendix A.

Assigning the industrial segments: Another key variable of the conceptual model of the present research is industrial segmentation. Among the various schemes of assignment, I choose Tolbert et al.'s (1980), which is one of the most widely recognized and used scheme of assigning industrial segments. As discussed in the literature review of Industrial Segmentation in Chapter III, this scheme is based on factor scores on the common dimension underlying indicators of economic oligopolistic and concentration scale and the characteristics of products and labor markets. Those factors fall into three basic categories of measures, which are the oligopolistic capacity in an industry, oligopolistic behavior in the industrial product and oligopolisticity in the industrial labor market. The authors aggregated 1970 Census industry categories into 55 groups. With this sample of industries, they did a

---

24 My exploration of the data indicates that the percent of displaced workers in secondary labor market segment in the sample only around 1-5%. This finding suggests that the definition of labor market segments and the definition of displaced workers do not completely overlap. In other words, the secondary segment in manufacturing industries is underrepresented, although previous studies suggest that in the overall American labor force, at least 10 percent of the male workers are in the secondary labor market and in the low-income areas, the percent can be as high as 26 to 32 (Rosenberg 1989). In short, few displaced manufacturing workers belong to the secondary segment. Therefore, this study focuses its analyses on the displaced workers of the two subsegments—Independent primary (upper-tier) and subordinate primary (lower-tier)—in the primary segment.

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Table 5-1.
CATEGORIES OF DOT VARIABLES:
PEOPLE AND SPECIFIC VOCATIONAL PREPARATION (SVP)

<table>
<thead>
<tr>
<th>PEOPLE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Mentoring</td>
</tr>
<tr>
<td>1</td>
<td>Negotiating</td>
</tr>
<tr>
<td>2</td>
<td>Instructing</td>
</tr>
<tr>
<td>3</td>
<td>Supervising</td>
</tr>
<tr>
<td>4</td>
<td>Diverting</td>
</tr>
<tr>
<td>5</td>
<td>Persuading</td>
</tr>
<tr>
<td>6</td>
<td>Speaking-Signaling</td>
</tr>
<tr>
<td>7</td>
<td>Serving</td>
</tr>
<tr>
<td>8</td>
<td>Taking Instructions-Helping</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC VOCATIONAL PREPARATION (SVP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>9</td>
</tr>
</tbody>
</table>


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factor analysis on the indicators of the above three oligopolistic domains. A core/periphery two-sector industrial index was developed by assigning factor scores to the industries and dividing the continuum into two with the largest break point. Since Tolbert et al.'s classification uses the 1970 Census industrial categories, the 1980 Census industrial categories are adapted to the 1970 Census industrial categories in order to apply the scheme to the current research. The results of the assignment of manufacturing industries of the 1980 Census Industrial Classification Categories to the core and periphery segments based on this scheme is presented in Appendix B.

The frequency distributions for the displaced workers in the labor market segments and industrial segments from the data are presented in Tables 5-2. Approximately 57%-66% of displaced workers were from the subordinate segment and 34%-43% from the independent primary segment; and approximately 79%-83% of manufacturing workers were displaced from the core segment, and 17%-21% from the periphery segment.

V.5. Defining Migrants Among the Displaced Workers

Migrants are defined as those who answered "Yes" to the question "Since that job, has ... (the respondent) moved to a different city or county to look for work or take another job?" As discussed previously, this question achieves three objectives: a) It filters out those who moved due to any reasons other than job-related reasons; b) it only includes those moves after displacement; c) it leaves out those who moved within V. METHODOLOGY
### Table 5-2.
FREQUENCY DISTRIBUTION OF THE DISPLACED WORKERS IN THE LABOR MARKET SEGMENTS AND INDUSTRIAL SEGMENTS

<table>
<thead>
<tr>
<th></th>
<th>1984 (%)</th>
<th>1986 (%)</th>
<th>1988 (%)</th>
<th>1990 (%)</th>
<th>1992 (%)</th>
<th>POOLED (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LABOR MARKET SEGMENT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Independent Primary Segment</td>
<td>424</td>
<td>431</td>
<td>327</td>
<td>303</td>
<td>361</td>
<td>1,885</td>
</tr>
<tr>
<td></td>
<td>(34.0)</td>
<td>(33.6)</td>
<td>(36.9)</td>
<td>(42.0)</td>
<td>(42.7)</td>
<td>(37.1)</td>
</tr>
<tr>
<td>Subordinate Primary Segment</td>
<td>824</td>
<td>853</td>
<td>558</td>
<td>419</td>
<td>484</td>
<td>3,193</td>
</tr>
<tr>
<td></td>
<td>(66.0)</td>
<td>(66.4)</td>
<td>(63.1)</td>
<td>(58.0)</td>
<td>(57.3)</td>
<td>(62.9)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,248</td>
<td>1,284</td>
<td>885</td>
<td>722</td>
<td>845</td>
<td>5,078</td>
</tr>
<tr>
<td></td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
</tr>
<tr>
<td><strong>INDUSTRIAL SEGMENT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Core Segment</td>
<td>1,036</td>
<td>1,070</td>
<td>735</td>
<td>572</td>
<td>680</td>
<td>4,169</td>
</tr>
<tr>
<td></td>
<td>(83.0)</td>
<td>(83.3)</td>
<td>(83.1)</td>
<td>(79.2)</td>
<td>(80.5)</td>
<td>(82.1)</td>
</tr>
<tr>
<td>Periphery Segment</td>
<td>212</td>
<td>214</td>
<td>150</td>
<td>150</td>
<td>165</td>
<td>909</td>
</tr>
<tr>
<td></td>
<td>(17.0)</td>
<td>(16.7)</td>
<td>(16.9)</td>
<td>(20.8)</td>
<td>(19.5)</td>
<td>(17.9)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,248</td>
<td>1,284</td>
<td>885</td>
<td>722</td>
<td>845</td>
<td>5,078</td>
</tr>
<tr>
<td></td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
</tr>
</tbody>
</table>

### Table 5-3.
FREQUENCY DISTRIBUTION OF MIGRATION STATUS AMONG THE DISPLACED MANUFACTURING WORKERS

<table>
<thead>
<tr>
<th></th>
<th>1984 (%)</th>
<th>1986 (%)</th>
<th>1988 (%)</th>
<th>1990 (%)</th>
<th>1992 (%)</th>
<th>POOLED (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MIGRATION STATUS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mover</td>
<td>229</td>
<td>208</td>
<td>180</td>
<td>141</td>
<td>144</td>
<td>927</td>
</tr>
<tr>
<td></td>
<td>(18.3)</td>
<td>(16.2)</td>
<td>(20.3)</td>
<td>(19.5)</td>
<td>(17.0)</td>
<td>(18.3)</td>
</tr>
<tr>
<td>Stayer</td>
<td>1,019</td>
<td>1,076</td>
<td>705</td>
<td>581</td>
<td>701</td>
<td>4,151</td>
</tr>
<tr>
<td></td>
<td>(81.7)</td>
<td>(83.8)</td>
<td>(79.7)</td>
<td>(80.5)</td>
<td>(83.0)</td>
<td>(81.7)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,248</td>
<td>1,284</td>
<td>885</td>
<td>722</td>
<td>845</td>
<td>5,078</td>
</tr>
<tr>
<td></td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
</tr>
</tbody>
</table>

V. METHODOLOGY
their original counties and thus clearly defines the physical distance scope of migration. Table 5-3 shows the number of movers and stayers following displacement among the displaced manufacturing workers for each of the five waves of data and the pooled data, respectively. Approximately 16%-20% of the displaced manufacturing workers who remained in the labor force had moved to another county or city to take another job or look for work following displacement. These percentages are much higher than that of the general American population and even higher than the overall displaced workers (see Footnote 2).

V.6. Dependent Variables and Multiple Regression Models

V.6.1. Earnings loss variables and model

As discussed above, the present thesis postulates that differentials in earnings outcomes for the displaced workers are functions of labor market segmentation, industrial segmentation, geographic mobility, interaction between labor market segmentation and occupational/industrial mobility, socio-economic and demographic variables. Based on this conceptual model, I developed three models, each of which regress one of the three earnings loss variables on the labor market segmentation, industrial segmentation, migration, occupational/industrial change, tenure, sex, race, education, marital status and so on. The operationalization of these three earnings variables is as follows:

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Earnings Change = weekly earnings in dollars at the lost job - weekly earnings in dollars at the current job;

Percent Lost = (weekly earnings in dollars at the lost job - weekly earnings in dollars at the current job) / weekly earnings in dollars at the lost job * 100;

Loss Ratio = weekly earnings at the lost job / weekly earnings at the current job.

For all three variables, the higher the value, the more earnings loss the worker suffered. Although they measure the same dimension of the consequence of work displacement--the earnings loss--the purpose of examining them all is to increase the confidence about the results of the model. As a matter of fact, these variables are different: Earnings Change measures absolute earnings difference in dollars between pre- and post-displacement jobs. However, this variable does not tell us how much the loss is relative to the pre-displacement earnings. For a white-collar professional, for instance, who made $600 a week before displacement and makes $400 at the current job, he/she lost $200, while for a blue-collar factory floor worker, who made $350 a week before displacement, and makes $150 at the current job, he/she also lost $200. With Earnings Change, we cannot tell the difference between these two losses.

However, compared to their pre-displacement earnings, the blue-collar workers actually lost more (57% of the pre-displacement earnings) while the white-collar professional lost less (33% of the pre-displacement earnings). Thus, to compensate this weakness, two variables, Percent Lost and Loss Ratio, measuring relative earnings change, are examined.

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With these three measures as dependent variables, the Ordinary Least Square (OLS) technique is used to test the following multiple regression models:

\[ Y_1, Y_2, Y_3 = a_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11} + b_{12}X_{12} + b_{13}X_{13} + b_{14}X_{14} + b_{15}X_{15} + b_{16}X_{16} + b_{17}X_{17} + b_{18}X_{18} + b_{19}X_{19} + e; \]

Where;

\[ Y_1 = \text{Earnings change} \]
\[ Y_2 = \text{Percent lost} \]
\[ Y_3 = \text{Loss ratio} \]
\[ X_1 = \text{Labor Market Segments (Subordinate or Independent Primary Segment)} \]
\[ X_2 = \text{Industrial Segments (Core or Peripheral Segments)} \]
\[ X_3 = \text{Migration Status (Move or Stay)} \]
\[ X_4 = \text{Interaction term between migration and subordinate segment OR interaction term between migration and core segment}^{25} \]
\[ X_5 = \text{Weekly earnings before displacement} \]
\[ X_6 = \text{Work tenure in years at the old job} \]
\[ X_7 = \text{Occupational change (Changed or Not)} \]
\[ X_8 = \text{Industrial change (Changed or Not)} \]
\[ X_9 = \text{Expected/notified or Not about the displacement} \]

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25 Pre-tests indicate high collinearity between these two interaction terms in the same model. To avoid collinearity, I substitute one for the other at a time instead of incorporating both of them at the same time in the OLS regression models.

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X10 = The year when the worker was displaced
X11 = Weeks without job following displacement
X12 = Hours worked during the week prior to the interview
X13 = Nonwhite
X14 = Female
X15 = Age
X16 = Age50 (1 = age 50 and >, and 0 = age 50 <)
X17 = Years of schooling completed
X18 = Marital Status
X19 = Displaced During Recessions (only for the pooled sample)

e = residual.

The detailed information on the composition and creation and abbreviated names of the dependent variables (Y variables on the left side of the equation) and the independent variables (X variables on the right side of the equation) is provided in Table 5-4.

V.6.2. Jobless duration variable and model

In regard of duration of joblessness following displacement, this study simply takes the number of weeks without work, which is derived from the question "How many weeks went by before ... started at another job." To be precise, the variable is defined as follows:

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Table 5-4.
A GLOSSARY OF VARIABLES IN THE MODELS

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earnings Change</td>
<td>The difference between the pre-displacement weekly earnings and the current weekly earnings in dollars;</td>
</tr>
<tr>
<td>Percent Lost</td>
<td>The difference between the pre-displacement weekly earnings and current weekly earnings expressed as percent of pre-displacement weekly earnings;</td>
</tr>
<tr>
<td>Loss Ratio</td>
<td>The ratio of the pre-displacement weekly earnings to the current weekly earnings;</td>
</tr>
<tr>
<td>Jobless Duration</td>
<td>Weeks went by before the respondent started working again at another job.</td>
</tr>
</tbody>
</table>

Independent Variables:

| Subordinate Segment | Subordinate primary segment = 1 and Independent primary segment = 0, based on Rumberger and Carnoy’s (1980) scheme; |
| Core Segment        | Core = 1 and periphery = 0, based on Tolbert et al.’s (1980) scheme; |
| Move                | Moved since displaced = 1 and stayed =0; |
| Move X Subordinate  | Interaction term between Move and Subordinate Segment; |
| Earnings Before     | Weekly earnings before displacement in dollars; |
| Education           | The number of years of schooling completed; |
| Tenure              | The number of years worked on that job when displaced; |
| Occupational Change | Three-digit census occupational code changed = 1 and Not changed = 0; |
| Industrial Change   | Three-digit census industry code changed = 1 and Not changed = 0; |
| Expected or Notified| Expected or notified of displacement = 1, and otherwise = 0; |
| Year Displaced      | The year when the respondent was displaced ranging from 1 to 5; |
| Weeks No Work       | The number of weeks went by before starting to work on another job; |
| Hours Worked        | The number of hours the respondent worked at the current job; |
| Nonwhite            | Nonwhite = 1 and white = 0; |
| Female              | Female =1 and male = 0; |
| Age                 | Years of age Ranging From 20 to 61; |
| Age50               | 20 through 49 =0; 50 through 61 =1; |
| Marital Status      | Currently married = 1 and else = 0; |
| Recessions          | Displaced during the recession years (1981-1984 and 1990-1992)=1 and else =0. |

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Jobless duration\textsuperscript{26} = The number of weeks that went by before the respondent started working again at another job.

This model is analyzed with two different conditional samples. The first conditional sample includes all those who remained in the labor force regardless of their current employment status (It is called \textit{unrestricted sample} hereafter). In other words, both those whose jobless spells have completed or were still in progress at the time of survey are included in the sample.\textsuperscript{27} The second conditional sample is restricted only to those workers who reported having jobs at the survey time (It is called \textit{restricted sample} hereafter). Strictly speaking, the restricted samples risk upward selection bias because the probability is large that there is a systematic association between the displaced workers' socio-economic and labor market characteristics and their current employment status. In other words, this selection

\textsuperscript{26} Podgursky and Swaim (1987a:214-15) refer to the weeks without work in the DWS as jobless duration in order to emphasize the difference between the normal CPS unemployment duration and DWS jobless duration. The DWS records a spell of joblessness which may include one or more periods of suspended job search and labor force withdrawal or were disrupted by temporary jobs, while the normal unemployment duration of the monthly CPS reports only a single spell of unemployment. They argue that the DWS measure of jobless duration is a better indicator of re-employment difficulties for displaced workers.

\textsuperscript{27} The 1984 and 1986 DWS's measures of jobless duration include those who had not been working since being displaced from their previous jobs up to the time of survey, while the 1988, 1990 and 1992 DWS filter out those who reported have not been working since being displaced. To put those who have not been working since being displaced in the latter three surveys back in this unrestricted sample, I assign the estimated average weeks without job to them, according to the year when they were displaced.

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tends to lead to the systematic exclusion of those who shared some common characteristics, which resulted in their jobless status at the survey time. Consequently, it threatens the samples’ representativeness of the population. Aware of this possible bias, this study still examines the jobless duration with the restricted sample. The reason is that the unrestricted samples include too many workers whose employment status is "still looking for job". Among them, there are many who were "still looking for job" because they were displaced later than others during the five-year survey period. Consequently, it pulls upward the average jobless duration of the sample and skews the data. The trade-off of restricting the samples to those who were re-employed is providing the model with a less skewed dependent variable. The purpose is to find whether the results would be substantially different from those with the unrestricted sample.

With this jobless duration variable as a dependent variable, the Ordinary Least Square (OLS) technique is used to test the following multiple regression model:

\[ Y = a_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11} + b_{12}X_{12} + b_{13}X_{13} + b_{14}X_{14} + b_{15}X_{15} + b_{16}X_{16} + e; \]

where;

\[ Y = \text{Jobless Duration in Weeks} \]
\[ X_1 = \text{Labor market segments (subordinate and independent primary Segments)} \]
\[ X_2 = \text{Industrial segments (core and peripheral segments)} \]
\[ X_3 = \text{Migration status} \]

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X4 = Interaction term between migration and subordinate segment OR interaction term between migration and core Segment

X5 = Weekly earnings before displacement

X6 = Work tenure in years at the old job

X7 = Expected/notified or NOT about the displacement

X8 = The year when the worker was displaced

X10 = Nonwhite

X11 = Female

X12 = Age

X13 = Age50 (1=age 50 and >, and 0=age 50<)

X14 = Years of schooling completed

X15 = Marital status

X16 = Displaced in recessions years (only for the pooled sample)

e = residual.

The detailed information on the composition and creation and abbreviated names of the dependent variable (Y variable on the left side of the equation) and the independent variables (X variables on the right side of the equation) is provided in the glossary table (Table 5-4).

V.7. The Independent Variables and Hypotheses

Based on the conceptual model of this study and the corresponding multiple-

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regression models spelled out in the previous section, the major independent variables the present study is interested in are labor market and industrial segmentation and migration. The other major variables incorporated are those measuring the occupational and industrial changes, the individual labor market experience such as earnings at the previous job and work tenure. The major socio-demographic and human capital variables incorporated are sex, race, education and marital status variables. In addition, the models control for several variables that the previous displacement studies usually incorporate, such as expectation or advanced notice of displacement and hours worked for the week before the interview (see Table 5-4).

Subordinate segment. As illustrated in the Table 5-4, for this variable subordinate primary segment is coded as 1 and independent primary segment as 0. From the dynamic segmentation perspective (Noyelle 1987) and the deindustrialization perspective (Bluestone and Harrison 1982), we stand at a critical juncture in U.S. economic, social, and technological history. This historical juncture is witnessing the emergence of a new paradigm of economy emphasizing services, flexible production, and customized consumption, characterized by the contracting middle segment and polarization. The workers displaced from the subordinate segment are dislocated from a shrinking middle of a three-segment labor market hierarchy in the U.S. economy.28

28 This study focuses on the two subsegments of the primary segment for reasons of both theoretical and data relevance (see Footnote 24).

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Therefore, they are more likely to experience downward mobility in earnings than the workers from the independent primary segment. Based on this dynamic segmentation argument, the present study hypothesizes that the characteristics of the displaced workers from the subordinate primary segment would negatively affect their post-displacement earnings. Similarly, the hypothesized relationship between this labor market segmentation variable and jobless duration is that workers from the occupations of subordinate segment would suffer longer duration of joblessness than those from the independent primary segment.

Core segment. Using Tolbert et al.’s (1980) scheme, this variable codes industries into core (1) and periphery (0) based on their degree of oligopolistic and competitiveness (see the section of Assigning Labor Market and Industrial Segments of this chapter and also Table 5-4). The capacity of core industries to offer primary employment was in large measure related to their ability to operate in an oligopolistic or monopolistic environment. During the past two decades, in addition to the decline of core industries in size as a whole, the existing core industries were becoming more and more reliant on the competitive external labor market strategies such as downsizing and flexibility, and less and less on the internal labor market strategies of protective nature (Noyelle 1987). Thus workers who lost core industrial jobs in a sense lost the protection of the internal labor market, which is unlikely to be recovered during deindustrialization. This is especially true to the manufacturing

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industries, where core firms were highly concentrated. Based on this perspective, the current study hypothesizes that workers dislocated from the core segment are expected to suffer more earnings loss than those from the periphery industrial segment. They are also more likely to suffer longer spells of joblessness due to the decline of core-like manufacturing industries.

**Earnings Before.**  *Earnings Before* is incorporated as the indicator of reservation wages based on the reservation wages differentiation perspective (Porgursky and Swain 1986b, Ashton and Iadicola 1989). From that perspective, workers with higher earnings before displacement tend to reject the early offers that do not meet with their reservation wages. If this argument holds, *Earnings Before* should have negative impact on the earnings loss holding constant the weeks without work. In other words, *Earnings Before* in the earnings loss models should be hypothesized having impact that reduces the earnings loss. From the same perspective, for the jobless duration model, the hypothesized relationship is that the higher the previous earnings, the longer the duration of joblessness.

**Tenure.** According to Podgursky and Swaim (1987), the relatively greater investments in specific human capital lead to larger earnings losses. However, Howland and Peterson (1988) note that because work tenure is highly correlated with age, when it is dropped from the model, age is highly significant. I would argue that

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tenure should have its own impact, because the longer an individual stayed with a job, the less flexible he/she is in the external labor market, and thus less likely to take a job different from his/her previous one. Even when they get a new job in another occupation, the chance is large for them to start low in earnings and thus suffer more earnings losses. Therefore, this study hypothesizes that the time an individual invested in the previous job would significantly increase his/her earnings losses and duration of joblessness as well.

**Education.** Once displaced, workers lost protection of the internal labor market and were exposed to the external labor market. In the external labor market, the workers were re-evaluated. During the years of deindustrialization, the industry-specific skills obtained on the job by the displaced workers from the shrinking and declining manufacturing industries would be reevaluated low (Kreckel 1980), whereas their general educational attainment became more important, because it would be valued largely as an indicator of retrainability for new skills. According to this argument, the present study hypothesizes that the more school years the worker completed, the less earnings loss and shorter jobless duration following displacement he/she would suffer.

**Move.** Against the human capital theory and neo-classic theory and from the new structuralist perspective as discussed in the theoretical framework and literature review, this study hypothesizes that migration by itself does not reduce the earnings

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loss for all the displaced workers from the manufacturing industries without taking the labor market structural effect into account. Although migration is to seek work or take another job as measured by the DWS, this study hypothesizes that migration would not significantly shorten the duration of unemployment, either.

Move x Subordinate and Move x Core. This study attempts to understand the labor market and industrial structural effects interacted with the effect of migration on the post-displacement economic outcomes for the displaced workers. Literature indicates that migration as a means of occupational and economic mobility does not work to an equal degree for all the workers across the segments of labor market, in spite of people’s rationality, as argued by the neo-classical theory. Thus, as one of the major hypotheses of the current study, migration is postulated, rather than being equally beneficial to all the displaced workers, to be more likely to have a reducing effect on earnings loss and duration of unemployment for the workers displaced from the independent primary segment than for the workers from the subordinate primary segment. In short, this study incorporates interaction term between migration and subordinate segment to examine the following null hypothesis: Migration for the workers from the subordinate primary segment has the same effect on the earnings loss and jobless duration as for the workers from the independent segment. Since on the one hand, deindustrialization presumably affected core manufacturing industries more than the peripheral ones, and on the other, core manufacturing workers had

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higher previous earnings than their peripheral counterpart, migration may not be able to reduce the income loss as much as that of their peripheral counterparts. Since deindustrialization has swept the nation's core manufacturing industries on the one hand, and on the other, core workers tend to have higher job expectation, migration may not be able to reduce the post-displacement jobless duration for the core workers to the same degree as for the peripheral workers. The interaction term between migration and core segment is used to test this null hypothesis: By migration, the core workers reduced earnings loss and jobless duration as much as the peripheral counterparts.

**Occupational Change and Industrial Change.** These two variables measure whether or not the displaced workers' 3-digit Census Occupational Classification codes and 3-digit Industrial Classification codes have changed when reemployed. One of the initial objectives of the CPS Displaced Workers Supplement in January 1984 was to examine whether displacement from the occupations and industries for many workers were permanent and how many workers could possibly be reemployed in the same or similar jobs or same industry (Flaim and Sehgal 1985). The data reveal that for the most workers, the displacement is permanent. The workers displaced from steel industry and the auto industry are prime examples of this type of situation. Many other manufacturing industries, particularly in the hard and durable goods sector, were similarly affected by a combination of cyclical factors and deep-seated structural

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problems such as plants that were no longer competitive in the face of foreign imports. The earnings loss models incorporate these two variables to separate their effects from those of labor market and industrial segmentation. The weakness for these two variables is that they do not tell either the direction or the magnitude of mobility, which should be important in determining the post-displacement earnings according to the previous mobility research. Given the deindustrialization assumptions about the decline of manufacturing industries and the previous evidence, the possibility of upward mobility on the job ladders and between industrial segments for most displaced workers from manufacturing industries seems small. Even if there is some upward mobility, abandonment of their industrial- and occupational-specific skills and experience and starting all over may result in lower wages at least at the beginning. Therefore, it is reasonable to hypothesize that occupational and industrial changes have positive effect on the earnings loss. In other words, displaced workers who were reemployed in a different occupation or in a different industry are expected to suffer more earnings loss than those workers who were reemployed in the same occupation and same industry as the ones from which they were laid off.

**Expected or Notified.** This variable derives from the question "Did ... (the respondent) expect or had ... (the respondent) received advance notice of a layoff or a plant or business closing?" From the job search perspective, most of previous research (Swaim and Podgursky 1989, Addison and Portugal 1987, Ehrenberg and

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Jakubson 1989, Love and Torrence 1989) using CPSDWS data incorporated this variable in their reemployment and unemployment duration models. The job search perspective postulates that the advanced knowledge of the coming layoff enables people to start their job search early, probably before the termination of the job, and thus is expected to reduce the duration of joblessness and income loss following displacement. The objectives of such studies are usually to draw policy implications to support the implementation of the advanced notification law. Most of them found that expectation and advanced notice significantly shortened the duration of unemployment for the displaced workers.29 But among the very few studies which incorporate this variable in their earnings models (Love and Torrence 1989), no effect is found on earnings loss. The current study, following the previous literature, hypothesizes that Expected or Notified is predicted to significantly shorten the jobless duration and reduce the earnings loss for the displaced manufacturing workers.

**Year Displaced.** This variable records the year when the respondent was displaced from the job during the five-year period for each survey, ranging from 1 (the first year) through 5 (the last year). For instance, the January 1984 survey covers the period from 1979 through 1983 and the numerical values refer to the ordinal number of the years for this period. In other words, the higher the value, the later the

29 But Ruhm (1992) argues that those studies overestimated the impact of the advanced notice on duration of unemployment due to their methodological flaws.

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year did the layoff occur during the period. Incorporating this variable, this study
tests the "catch-up" hypothesis (Podgursky and Swaim 1987b), which conjectures that
the earnings of the displaced workers will gradually catch up with the pre-
displacement level. Thus, for the reemployed workers, the earlier they were displaced
during the survey period, the more 'catch-up' time they would have up to the survey
time and thus the less the earnings loss. In other words, this variable is expected to
have positive effect on the earnings loss: The later a worker was displaced during the
five-year period, the more earnings loss he/she would suffer. However, for the
jobless duration model, Year Displaced serves merely as a control because the later
the workers were displaced, the closer it would be to the survey date and the shorter
would be the reported weeks without work.

**Weeks No Work.** Incorporation of this variable in the earnings models is to test a
hypothesis against the reemployment negative selectivity proposition (Podgursky and
Swaim 1987b). This proposition asserts that reemployment tends to be negatively
selective: Workers who take longer to locate another job would lose less earnings
because it is a sign that they do not accept wages lower than their reservation wages,
while those with a shorter spell of joblessness tend to lose more earnings because they
seem more willing to accept lower wages. The underlying assumption of this neo-
classical proposition is that there lacks no jobs in the job market and the cause for
variation in jobless duration is on the supply side of labor. The workers with longer

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jobless duration is because they spend more time shopping around for better-paying jobs. Thus, the longer period of unemployment may result in better earnings, whereas those who jumped on jobs may end up with lower earnings. This proposition totally neglects the causes on the demand side of labor and ignores the possibility of being unable to find jobs for a prolonged period of time for many displaced manufacturing workers during the 1980s' labor market turbulence. The prolonged jobless spell can aggravate the pressure on the workers to accept lower-paying jobs than their previous ones. Based on this argument, the present study hypothesizes: For the displaced workers, the longer the duration of unemployment, the higher the earnings loss.

**Hours Worked.** The present regression models control for this variable because the samples for the earnings models include all the displaced workers who worked during the week prior to the interview despite the number of hours they worked. This variable, therefore, should be important for the variation of the current weekly earnings, which would in turn determine the difference in the weekly earnings between the pre- and post-displacement jobs. This variable should also be controlled for if the sample were only restricted to full-time reemployed workers, since people could work overtime or on their second jobs. However, it is important to include the workers who worked part-time because part-time employment, as the literature on deindustrialization and economic restructuring suggests, has become a permanent scene on the American labor market landscape. Workers could work on two or more

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part-time jobs following displacement, which could exceed hours of full-time employment, but still make less on an hourly basis. This variable is expected to have a negative effect on earnings loss. That is, the longer the hours, the less the earnings loss for the worker, holding everything else constant.

**Nonwhite and Female.** Nonwhite displaced workers include African Americans, Hispanic Americans, Native Americans and Asians. Following the literature on the labor market segmentation along the race and gender line, the models of the present study include these two socio-demographic variables expecting that being nonwhite would have a positive effect on the earnings loss and jobless duration following displacement. Being female is hypothesized to be another factor contributing to the earnings loss and jobless duration.

**Age and Age50.** Both of these demographic variables are incorporated in the regression models of the current study. Some previous studies find that the older the worker the longer it took them to locate another job and more likely for him/her to lose earnings if they were reemployed. But other studies regard age as having a curvilinear effect on earnings loss and duration of unemployment. That is, age is not a factor causing earnings losses and longer duration of unemployment until it is reaching a turning point such as age 45 or age 50. Following this line of research, this research tries to test on this variable. Although incorporating both variables in

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the models, I tend to support the latter because it is more theoretically sound.

**Marital Status.** The previous research incorporated a variable about whether the respondent is household head or not and found that the household head was much more likely to lose earnings but tended to find job sooner than the nonhousehold head. The results were used to support arguments about the negative selectivity of employment. But few studies looked at the effect of marital status on earnings and jobless duration. This study includes this variable to examine whether married people tend to lose more earnings and experience shorter duration of unemployment or not.

**Recession.** A major initial objective of the Displaced Workers Supplement in January 1984 CPS is to find out what happened to workers when recession during the 1980-1983 struck the economy, especially to the key manufacturing industries (Flaim and Sehgal 1985). Since the current study covers a period as long as 12 years, cyclical recessions can be an important factor independent of the long-term structural changes of the American economy. With the pooled data, it is plausible to examine the existence of their effect. In addition, although it is the latter that the current study is interested in, I believe it is necessary to rule out the short cyclical effect in order not to misspecify the models for the pooled sample. In the discipline of economics, the definition of a recession is that "A recession is an economic downturn; a recession is said to occur when real GNP has declined for two successive calendar

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quarters" (Samuelson 1989:204). Three salient characteristics of a recession are: 1) real GNP falls; 2) the demand for labor falls; 3) business profit falls (Samuelson 1989:213-214). By the technical criterion about the GNP growth rate, there two evident recessions shown in Figure 5-1: The percentage changes of GNP were negative for the two consecutive quarters (-5.7% for the last quarter of 1981 and -5.6% for the first quarter of 1982, and -2.5% for the last quarter of 1990 and -2.8% for the first quarter of 1991). The figure also shows that the corresponding rise of unemployment rates following the drop of GNP growth rates for these periods. In addition, the high unemployment rates lasted and lowered gradually after GNP began to come back. Therefore, to create this recession variable, I follow the change in unemployment rates more closely than changes in GNP. Also I take into consideration the fact that workers displaced shortly before the recessions are also subject to the strike of recessions during their post-displacement job search period. Following these two conditions, I code the years when the workers were displaced--1981, 1982, 1983, 1984, 1990 and 1991 as 1 and otherwise as 0. Since this variable measures whether the displacement occurred during a recession year or not, it may be more accurate to call it "Displacement in the Recession Years". I hypothesize that everything else being the same, the manufacturing workers displaced during the recession years suffered more earnings loss and longer duration of unemployment.

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Figure 5-1. Quarterly Percentage Change of GNP and Quarterly Unemployment Rate: 1979-1991.

Sources:

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CHAPTER VI

FINDINGS FROM THE EARNINGS LOSS MODELS

VI.1. Descriptive Statistics

The descriptive statistics for the variables incorporated in the regression models are presented in Table 6-1 and Table 6-2, respectively. Table 6-1 presents the distribution of migrants and non-migrants among the displaced manufacturing workers across the labor market segments and industrial segments. Comparing the proportions of movers against stayers between the independent primary and subordinate primary segments, we find that they are 21.1% vs. 13.5%, 26.4% vs. 19.2%, 25.1% vs. 15.0%, 23.8% vs. 17.0% for the 1986, 1988, 1992 and pooled data, respectively. The Chi-square tests suggest that differences between them are statistically significant except for the 1984 and 1990 surveys. This indicates that in the 1986, 1988, 1992 surveys, workers from the independent primary segment workers were more likely to move to another locality to look for work or take another job than their counterparts from the subordinate primary segment. The comparison across the labor market segments for the pooled data shows a nearly 7% difference between the independent and subordinate primary segments, suggesting an overall tendency that workers displaced from the independent primary segment are more likely to move than their counterparts from the subordinate primary segment. Comparing across the industrial segments, Table 6-1 shows that for the 1984 and 1992 data, core workers are
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<th>SURVEY YEAR</th>
<th>MIGRATION</th>
<th>INDEPENDENT (%)</th>
<th>SUBORDINATE (%)</th>
<th>CORE (%)</th>
<th>PERIPHERY (%)</th>
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<td>1984</td>
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<td>340 (81.5)</td>
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<td>Total</td>
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<td>417 (100.0)</td>
<td>514 (100.0)</td>
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<tr>
<td>1986</td>
<td>Stay</td>
<td>250 (78.9)</td>
<td>538 (86.5)</td>
<td>650 (83.0)</td>
<td>138 (88.5)</td>
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<td>84 (13.5)**</td>
<td>133 (17.0)</td>
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<td>Total</td>
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<td>622 (100.0)</td>
<td>783 (100.0)</td>
<td>156 (100.0)</td>
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<td>93 (78.2)</td>
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<td>81 (19.2)*</td>
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<td>421 (100.0)</td>
<td>541 (100.0)</td>
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<td>69 (20.3)</td>
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<td>Stay</td>
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<td>15 (11.7)*</td>
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<td>POOLED</td>
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<td>318 (23.8)**</td>
<td>377 (17.0)**</td>
<td>592 (20.5)**</td>
<td>103 (15.5)*</td>
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<td>Total</td>
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<td>2,217 (100.0)</td>
<td>2,889 (100.0)</td>
<td>663 (100.0)</td>
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</table>

* Chi-square is used to test the difference across the cells between independent and subordinate labor market segments and core and periphery industrial segments.

*p < .05; **p < .01; ***p < .001.

VI. FINDINGS FROM THE EARNINGS LOSS MODELS
significantly more likely to move to another locality to look for work or to take another job than the periphery workers following displacement (21.0% vs. 12.5%, and 21.2% vs. 11.2%). The percentages for the pooled data across the industrial segments are 20.5% vs. 15.5%, respectively, suggesting a overall tendency that the workers from the core segment are significantly more likely to move than their periphery counterparts. However, the differences in proportions between movers and stayers across the industrial segments are not statistically significant for the 1986, 1988 and 1990 surveys.

Table 6-2 lists the means and standard deviations for both dependent and independent variables in the earnings models. The samples include only those whose working hours for the survey week do not equal to zero. Among the dependent variables, the means of Earnings Change show that the mean dollars lost are $29.92, $22.42, $17.01, $19.20, $33.72 per week, for the five samples, respectively, and for the pooled sample, the mean dollars lost are $28.21. A pattern is observed from this group of means. That is, the workers displaced during the 1979-1983, 1981-1985 and 1987-1991 survey periods lost more earnings than those displaced during the 1983-1987 and 1985-1989 survey periods. This pattern appears to be recession-related. That is, during the survey periods covering recession years, displaced workers tended to lose more earnings than during the survey periods covering non-recession years.

30 Both frequencies and medians from all the five panels of data show that approximately 50% of the displaced workers made less earnings at their current jobs than at their previous ones.

VI. FINDINGS FROM THE EARNINGS LOSS MODELS

118
### Table 6-2.
MEANS AND STANDARD DEVIATIONS FOR THE FIVE WAVES AND POOLED DISPLACED WORKERS DATA

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<td>22.42</td>
<td>158.09</td>
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<td>165.11</td>
<td>19.20</td>
<td>165.07</td>
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<td>185.15</td>
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<td>41.98</td>
<td>-2.23</td>
<td>44.92</td>
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<td>Earnings Before</td>
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</table>

| N                       | 629       | 924       | 634       | 565       | 611       | 3407      |

VIL. FINDINGS FROM THE EARNINGS LOSS MODELS
The mean Percent Lost shows that the displaced manufacturing workers experienced 2.83%, .91%, -2.23%, -1.65%, and 2.97% changes between the pre- and post-displacement weekly earnings using the pre-displacement earnings as reference, for the five samples, respectively. When the data were pooled, the mean change is .78%. Again the pattern that emerges from this group of means shows that displaced workers as a whole appeared more likely to make less at the current jobs than the previous jobs during the recession years than during the non-recession years. In addition, such small percentages to some extent suggest that not all the workers made less. During the nonrecession periods (1983-1987 covered by the 1988 survey and 1985-1990 covered by the 1990 survey), the mean percent changes actually show some gains.

The means for the variable Loss Ratio are 1.34, 1.32, 1.21, 1.19, and 1.28 for the five panels, respectively and 1.27 for the pooled sample, which also show that for the overall displaced workers the pre-displacement earnings were higher than the post-displacement earnings. A trend similar to the above is also found from this series of the mean values, that is, the displaced workers appeared to lose more during the recession years than during the non-recession years. In sum, the trend that the five panels of data reveals that recession may play an important role in the earnings loss of displaced workers. Therefore, it is legitimate to incorporate a recession variable in the earnings loss models for the pooled sample.

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The mean values of Subordinate Segment and Core Segment variables show the proportions of workers in subordinate segment and core segment in the samples of all reemployed workers regardless of their working hours. They range from 58% to 66% for the subordinate primary segment, and range from 80% to 84% for the core segment. They are basically the same as the mean values from the samples including both workers who were reemployed and who were still out of work at the survey time presented in the Table 5-2 in the previous chapter. The means for the variables Move and Move x Subordinate suggest that among the displaced manufacturing workers in the five surveys, about 19%, 16%, 22%, 21% and 19% moved to look for work or to take another job following displacement, while among the workers who moved following displacement, about 12%, 9%, 12%, 12% and 8% were from the subordinate segment, for the five waves, respectively. The mean years spent on the job lost (Tenure) range from 6.5 to 8.8. For the five samples the mean weekly earnings before displacement (Earnings Before) range from $325 (1984) to $462 (1992) without taking inflation into consideration. According to the classification in McMahon and Tschetter's discussion of the declining middle class (1986:23), this average pre-displacement weekly earnings of manufacturing workers at least falls into the lower end of the Top Third of the America's earnings hierarchy, even taking inflation into account.31

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31 McMahon and Tscheter (1986:23) classified the distribution of full-time employment weekly wages into Top Third ($382 to $773), Middle Third ($264 to $382) and Bottom Third ($71 to $264) for the period between 1973 and 1982. The

VI. FINDINGS FROM THE EARNINGS LOSS MODELS
The mean value of Recession variable for pooled data suggests that over 50% of manufacturing workers were displaced during the five recession years (1981-1983 and 1990-1991). Since five years are 42% of a twelve-year period but over half of displacement occurred during these years, it seems to indicate that the recession years resulted in somewhat higher displacement rate than did the non-recession years. The mean values of the variables Occupational Change and Industrial Change show that about 70%-75% of the displaced manufacturing workers changed their occupations after being displaced from the previous jobs, and about 75%-80% changed their industries when they were reemployed. The literature based on the data used for the current study (Flaim and Sehgal 1985; Horvath 1987; Herz 1990 and Herz 1991) indicates that the occupational and industrial mobility rates for the overall displaced workers were roughly the same, ranging between 45% and 55%, indicating that the displaced workers are as likely to change occupations as to change industries when reemployed. The comparison in occupational and industrial mobility between the overall displaced workers and displaced manufacturing workers apparently suggests that the manufacturing workers had more difficulties finding jobs in the same

assumed annual inflation rate is 4%. Since each survey covers a five year period, given the assumed rate, the calculation of inflation for the pre-displacement weekly earnings for the 1984 survey, for instance, is as follows: Weekly earnings - (weekly earnings x 4% x 2.5 years, assuming half of the sample was displaced in the first half of the five-year period). In this case, $325 - ($325 x .04 x 2.5) = $292.5.

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occupational and same industrial line following displacement.\textsuperscript{32}

The mean values for the variable \textit{Expected or Notified} suggest that more than 60\% of the displaced workers received advance notice or expected the coming layoff. The mean weeks without work after displacement are 28.6, 29.2, 18.8, 16.7 and 17.5, for the five samples, respectively. From the five waves of data, there seems to emerge a descending pattern of the jobless duration with an upward tail for the last wave. From this pattern, we may infer that the impact of the first recession on the jobless duration was more severe than that of the second recession. The mean hours worked during the week before the survey are little more than 40 and do not vary much at all across the samples.

Regarding socio-demographic and human capital variables, the mean age of the displaced manufacturing workers ranges from 36.8 to 40.3. About 15-20\% of them were beyond age 50; the pooled sample also shows that among the displaced workers about 87\% are Whites and 70\% are males; the mean education level is about 13 years or around the high school diploma equivalent, and 72\% were married.

\textsuperscript{32} Workers displaced from mining and manufacturing industries were more likely to change industries than workers from other industries (Herz 1990, Flaim and Seghal 1985). In the 1984 DWS, for instance, 50\% of overall displaced workers stayed in the same industries when reemployed while the corresponding percentages are only 40\% and 35\% for the durable goods manufacturing industries and the non-durable goods manufacturing industries, respectively (Flaim and Sehgal 1985:10). In terms of occupational change, technicians and related support, handlers and equipment cleaners, helpers, and laborers are most likely to changes occupations. Machine operators, assemblers and inspectors were more likely than most other workers to move into service jobs (Horvath 1987:12).

\textbf{VI. FINDINGS FROM THE EARNINGS LOSS MODELS}
VI.2. Results from the Earnings Change Model

The estimated parameters of the ordinary least square analysis from the earnings regression models are presented in Tables 6-3, 6-4 and 6-5, respectively. Table 6-3 presents the estimated coefficients from the OLS regression model with the difference between the pre-displacement weekly earnings and the current weekly earnings in dollars as the dependent variable (Earnings Change). The higher the value of this variable, the more dollars lost. The constants in the table show that holding constant all the independent variables, the manufacturing workers displaced during the 1984 and 1988 survey period gain an average of $20.85 and $22.98 per week, while workers displaced during the 1986, 1990 and 1992 survey periods lost an average of $106.69, $57.77 and $329.62, respectively. However, the only statistically significant coefficient of the constants is the one for the 1992 survey. When the data are pooled, however, the constant shows hat if holding constant all the independent variables, the displaced workers gained $67.63 on average.

Comparing the results of this model across the five panels of data, the estimated coefficients for Subordinate Segment are positive and statistically significant for the 1986, 1988 and 1990 data, respectively, but not for the 1984 and 1992 data. The coefficients suggest that for the 1986, 1988 and 1990 survey periods, the manufacturing workers displaced from the subordinate primary labor market segment suffered $27.46, $65.04 and $30.54 more earnings loss than the workers from the independent primary labor market segment, but this segmental differential in earnings
### Table 6.3.
The OLS Regression Coefficients from the Earnings Change Model

<table>
<thead>
<tr>
<th>Independent Variables:</th>
<th>1984 (b)</th>
<th>1986 (b)</th>
<th>1988 (b)</th>
<th>1990 (b)</th>
<th>1992 (b)</th>
<th>POOLED (b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subordinate Segment</td>
<td>20.13</td>
<td>27.46***</td>
<td>65.04***</td>
<td>30.54*</td>
<td>27.35</td>
<td>42.30***</td>
</tr>
<tr>
<td>Core Segment</td>
<td>-.14</td>
<td>.52</td>
<td>-.11.72</td>
<td>-4.90</td>
<td>-20.76</td>
<td>-12.59*</td>
</tr>
<tr>
<td>Move</td>
<td>13.86</td>
<td>-2.95</td>
<td>-.08</td>
<td>11.52</td>
<td>8.66</td>
<td>-2.17</td>
</tr>
<tr>
<td>Move X Subordinate</td>
<td>-21.78</td>
<td>23.75</td>
<td>-2.57</td>
<td>19.235</td>
<td>-23.48</td>
<td>10.34</td>
</tr>
<tr>
<td>Earnings Before</td>
<td>.48***</td>
<td>.51***</td>
<td>.44***</td>
<td>.39***</td>
<td>.41***</td>
<td>.45***</td>
</tr>
<tr>
<td>Tenure</td>
<td>2.44**</td>
<td>2.83***</td>
<td>2.79**</td>
<td>1.94*</td>
<td>2.85**</td>
<td>2.45***</td>
</tr>
<tr>
<td>Occupational Change</td>
<td>40.59</td>
<td>50.54***</td>
<td>16.03</td>
<td>51.48***</td>
<td>54.99***</td>
<td>42.07***</td>
</tr>
<tr>
<td>Industrial Change</td>
<td>51.71***</td>
<td>36.58***</td>
<td>48.64***</td>
<td>39.74**</td>
<td>78.56***</td>
<td>47.32***</td>
</tr>
<tr>
<td>Expected or Notified</td>
<td>9.71</td>
<td>.41</td>
<td>-31.62**</td>
<td>-21.16</td>
<td>.54</td>
<td>-9.67*</td>
</tr>
<tr>
<td>Year Displaced</td>
<td>16.01***</td>
<td>12.55***</td>
<td>11.78***</td>
<td>16.73***</td>
<td>20.94***</td>
<td>16.27***</td>
</tr>
<tr>
<td>Weeks No Work</td>
<td>1.13***</td>
<td>.58***</td>
<td>.65**</td>
<td>1.02***</td>
<td>.78**</td>
<td>.88***</td>
</tr>
<tr>
<td>Hours Worked</td>
<td>-3.00***</td>
<td>-4.13***</td>
<td>-2.65***</td>
<td>-3.52***</td>
<td>-3.67***</td>
<td>-3.48***</td>
</tr>
<tr>
<td>Nonwhite</td>
<td>-3.41</td>
<td>7.84</td>
<td>3.81</td>
<td>-10.27</td>
<td>2.88</td>
<td>3.24</td>
</tr>
<tr>
<td>Female</td>
<td>20.32</td>
<td>49.08***</td>
<td>50.65***</td>
<td>22.39</td>
<td>16.01</td>
<td>33.59***</td>
</tr>
<tr>
<td>Age</td>
<td>-1.44*</td>
<td>-.55</td>
<td>.41</td>
<td>-.61</td>
<td>-.61</td>
<td>-.60</td>
</tr>
<tr>
<td>Age50</td>
<td>24.66</td>
<td>-1.79</td>
<td>-13.99</td>
<td>22.30</td>
<td>26.27</td>
<td>14.33</td>
</tr>
<tr>
<td>Recession</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10.68*</td>
</tr>
<tr>
<td>(Constant)</td>
<td>-20.85</td>
<td>106.69</td>
<td>-22.98</td>
<td>57.77</td>
<td>329.62*</td>
<td>-67.63**</td>
</tr>
<tr>
<td>Adjusted R^2</td>
<td>.375</td>
<td>.356</td>
<td>.343</td>
<td>.305</td>
<td>.319</td>
<td>.346</td>
</tr>
<tr>
<td>F-ratio</td>
<td>21.90***</td>
<td>29.37***</td>
<td>19.25***</td>
<td>14.75***</td>
<td>47.07***</td>
<td>95.94***</td>
</tr>
<tr>
<td>N</td>
<td>629</td>
<td>924</td>
<td>634</td>
<td>565</td>
<td>611</td>
<td>3407</td>
</tr>
</tbody>
</table>

* p < .05; ** p < .01; *** p < .001.

VI. FINDINGS FROM THE EARNINGS LOSS MODELS
losses was not found for the 1984 and 1992 survey periods. To understand this inconsistency between the data over the last 12 years, we may need to go beyond the data and look at the time specific effects of a twelve-year period. That is, the inconsistency may reflect the fluctuation of labor market demand associated with the two major recessions (1981-1984 and 1990-1991) that occurred during this period: Labor market segmentation has its effect on the earnings loss of the displaced workers only under normal economic circumstances. In other words, the labor market has the demand for labor, but it differentiates the work force along the labor market segment lines. While during the recessions, labor market lacks demand to such an extent that all the displaced workers regardless of their labor market segmental attributes were not able to avoid earnings loss. Thus, the differential in earnings loss due to labor market segmentation is not striking. The coefficient of *Subordinate Segment* for the pooled data with a sample of 3407 valid cases is 42.30, significant at .001 level. It suggests that workers displaced from the subordinate segment lost $42.30 more than workers from the independent segment. This result clearly indicates that workers from the subordinate segment suffered greater earnings loss following displacement than their counterparts from the independent segment.

The coefficient of *Recession* in the model for the pooled data is 20.44 and significant at .001 level. Interpreted literally, it means that the workers displaced during the recession years suffered an average $20.44 more than the workers displaced during the non-recession years, with everything else being the same. This

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finding confirms the existence of an independent effect of the short term cyclical recessions on the differentials in earnings loss of the displaced workers.

With regard to the impact of industrial segmentation on the earnings losses, the estimated coefficient parameters show that differences in earnings change between the core and periphery industrial segments are not statistically significant. In other words, the data from the five individual waves of survey fail to reject the null hypothesis that the workers displaced from the core industries suffered as much earnings loss in dollars as the workers from the peripheral industries. However, the coefficient for the model with the pooled sample is -12.59, significant at .05 level. That is, when the five panels of data are pooled, the effect of being from the core industrial segment emerges. The workers displaced from the core industries suffered $12.59 less earnings loss per week than the workers from the peripheral industry segment. Following the objective of pooling the data, this finding suggests that there is such a weak causation between being from the core industries and earnings loss that only shows up when the sample reaches to a certain size.

As hypothesized, the coefficients for migration (Move) are not significant in any of the five waves of data, nor is it in the pooled data. Contrary to the expectation of the neo-classical and human capital theories, this finding suggests that overall displaced workers did not lessen their income loss by migration following displacement. Surprisingly, however, instead of confirming the theoretical expectation from the labor market segmentation perspective, none of the estimated coefficients for

VI. FINDINGS FROM THE EARNINGS LOSS MODELS
Move x Subordinate in the six samples are statistically significant. The Variance Inflation Factor (VIF) values for this interaction term are below 3.00 in all the six samples, suggesting that its collinearity with the other variables in the model is within the acceptable level. This result indicates that the effect of migration on the earnings loss does not vary across migrants’ labor market segments. Together, these two results show that migration failed to reduce the earnings losses for the displaced manufacturing workers from either segment. My speculation is that to specify the migration effect on the post-displacement earnings for the displaced manufacturing workers, we may need data on economic conditions of both origin and destination, workers’ information network and household structure as well as the time of migration.

All the coefficients of Earnings Before are positive and significant at .001

33 The coefficients of Move x Core that substitutes for Move x Subordinate in the earnings models are not statistically significant. The coefficients’ directions and values of the other variables in the models are not substantially different from those in the original one, either. In addition, the adjusted-R²s for all the samples show no improvement on the goodness of fit. Thus to avoid redundancy, the results from the earnings models with this substitution are not presented.

34 In order to test segmental effect along the race and gender lines, both the earnings model and jobless duration models are tested with the White/Move and Male/Move interaction terms, respectively, as substitutes for the Subordinate/Move interaction terms. The results from the three earnings models literally suggest that White displaced manufacturing workers were able to reduce earnings loss by migration. However, the Variance Inflation Factor (VIF) values are over 10.00, indicating that there is high collinearity between this interaction term and other variables in the model. Therefore, this finding should be interpreted with caution. The coefficients of these two interaction terms are not significant in the jobless duration model.

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level. It indicates that for every additional dollar the displaced manufacturing worker made at the pre-displacement job led to the $.48, $.51, $.44, $.39, $.41 and $.55 earnings loss. This finding confirms the hypothesis that higher the pre-displacement earnings a worker made, the more earnings he/she is likely to lose in absolute number of dollars, holding everything else constant. The finding is apparently in sharp contradiction with the hypothesis derived from the reservation wages theory, implying that it was difficult for the displaced manufacturing workers with relatively high wages to find an equally high paying job after displacement and thus would lose relatively more in the context of deindustrialization.

The coefficients of Tenure are positive and significant across all the panels of data including the pooled data. It suggests that the displaced manufacturing workers suffered $2.44, $2.83, $2.79, $1.94, $2.85 and $2.48 earnings loss for each additional year spent on the pre-displacement job, for each of the six samples, respectively. This finding supports the hypothesis that longer a worker stayed with his/her pre-displacement job, the more he/she would lose in absolute number of dollars. It indicates that the longer a workers stayed at a manufacturing job, the higher his/her would be his/her previous income; thus it would be harder for him/her to find jobs with comparable earnings. In this sense, job specific investment was harmful for the displaced manufacturing workers.

In contrast with the work tenure variable, as hypothesized, Education attainment expressed as the school years completed becomes important for the

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displaced manufacturing workers for their post-displacement earnings. The coefficients of this variable are negative and highly significant (.001 level), across all six samples. Interpreting these coefficients literally, for each additional school year completed, a worker could reduce earnings loss by $8.45, $13.79, $9.60, $13.53, $12.54 and $10.87 per week, for each of the six samples, respectively. The implication of this finding, along with the findings from the variables discussed so far, is twofold: on the one hand, work tenure--the displaced workers' job-specific investment--is not in favor of the displaced manufacturing workers in the external labor market, especially during a period of decline of American manufacturing industries; on the other hand, general educational attainment--an indicator of adaptability to the market demand in the external labor market--becomes an important plus factor in determining their post-displacement earnings. These findings further confirm that in the context of the rapidly changing American industrial structure and technology, the labor market demands high adaptivity of its work force, which was closely associated with the general educational level, while long work tenure in the manufacturing industries, on the contrary, largely represents the obsolete technology and its related skills.

Confirming the hypothesis, the results from the dichotomous Occupational and Industrial Change variables in the model show that post-displacement changes in occupation and industry are among the major factors responsible for earnings loss between the pre- and post-displacement jobs. The coefficients of Occupational Change

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are positive and highly significant (at .001 level) for the 1986, 1990, 1992 and the
pooled samples but not for the 1984 and 1988 samples, and the coefficients of
*Industrial Change* are all positive and highly significant. As discussed in the
development of the hypothesis for occupational changes, the direction of occupational
mobility is important in determining the earnings changes between two jobs. The
present study uses this variable as a proxy for downward mobility based on the
assumption that most displaced manufacturing workers would experience downward
mobility. For the manufacturing workers, especially for those who were displaced
from the major declining industries, new jobs comparable with their old ones are hard
to find. And even if under circumstances of upward mobility, there is a high
probability for the workers to start low since they abandoned their investment in their
old jobs and lack experience in the new ones. However, if the data contain too many
cases in the upward direction of mobility, this assumption can be violated and the
results can be uninterpretable. The non-significant coefficients of occupational changes
for the 1984 and 1988 samples may be due to the data contamination of this sort.

The coefficients of *Expected or Notified* are not significant for any of the
waves except the 1988 survey. This result suggests whether the displaced
manufacturing workers had the knowledge of impending layoff or not did not make a
difference in their earnings change. This result confirms the findings of previous
studies, suggesting that even with the knowledge of impending displacement, the
workers were not able to prevent earnings loss following displacement. The exception

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is the 1988 sample, which may be due to the improving labor market conditions
during the period covered by this survey. However, this inference is not conclusive
without further evidence.

As expected, the coefficients of Year Displaced are positive and significant at
.001 level for all six samples. The coefficients represent $16.01, $12.55, $11.78,
$16.73, $20.94, and $16.48 loss for each additional year later than the first year
during each survey period. In other words, among the reemployed workers, the
earlier in the survey period a worker was displaced, the less earnings loss would
he/she suffer at the time of survey. This finding confirms the "catch-up" hypothesis
(Podgursky and Swaim 1987b), which posits that earnings catch up considerably
within three to five year period following displacement.

As predicted, the coefficients of Weeks No Work are positive and significant at
.001 level for all six samples. These coefficients represent $1.13, $.58, $.65, $1.02,
$.78, and $.94 loss for each additional week without work after displacement for the
corresponding panels of survey, respectively. It suggests that the longer the jobless
duration, the more likely is a worker to accept wages lower than his/her
pre-displacement wages. Thus, this finding disconfirms the negative selection
hypothesis, which argues that the jobless duration is positively associated with the
unemployed workers’ job search time and reservation wages; thus the longer jobless
duration is expected to result in less earnings loss once reemployed.

Hours Worked is an important control variable since the samples for this model

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include all workers who worked at the survey regardless of their working hours and full- and part-time employment status; This selection of sample leaves working hours open for variation, since the workers in samples can either work full-time or part-time or over time. The hours worked should be partially responsible for the variance in the earnings regardless of other factors. The coefficients are highly significant (all at .001 level) for all the six samples and the signs are negative as expected. That is, for every additional hour worked, a worker reduced $3.00, $4.13, $2.65, $3.52, $3.67, and $3.48 earnings loss, for the 1984, 1986, 1988, 1990, 1992 and pooled samples, respectively. This finding implies that increase in working hours can be a strategy to compensate the earnings loss at the post-displacement jobs.

The coefficients of Nonwhite are not significant for any of the panels.\(^{35}\) In comparison with the finding from the labor market segmentation variable, this result may indicate that race is not as important as labor market characteristics in the post-displacement external labor market experience. This finding is another piece of evidence that race is not perfectly parallel with social class expressed as labor market segments in the present case. The coefficients of the Female variable are not consistent across the samples. For the 1986, 1988 and the pooled samples, they are highly significant and positive as expected, suggesting that the female displaced workers suffered an average of $49.08, $50.65 and $33.59 more earnings loss than

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\(^{35}\) The 1984 DWS data show that among the general displaced population during the 1979-83 period, black men had smaller earnings losses than white men and white women has smaller earnings than black women (Kletzer, 1991).

VI. FINDINGS FROM THE EARNINGS LOSS MODELS

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male workers holding other variables constant. But this relationship is not found from the other samples.

The coefficients of both the variables Age and Age50 show that the effect of age on the earnings loss is negligible. For Age, the coefficient is negative and significant at .05 level, only for the 1984 data, indicating that for each additional year in age, a worker reduced $1.44 earning loss. Contrary to the hypothesis, this result implies a negative linear relationship between age and earnings loss. However, for the variable Age50, the coefficient is not significant for any of the samples. Thus it disconfirms the existence of a curvilinear relationship between workers’ age and earnings loss.\textsuperscript{36}

Being currently married can be an advantageous status as well as disadvantageous status for the displaced workers. On the one hand, the possible availability of a working spouse’s earnings can help the displaced worker survive better through post-displacement job search; on the other, the psychological pressure of unemployment for married individuals could be greater than for the unmarried individuals, which may lead them to taking jobs with lower-than-reservation wages. However, the former argument is only supported by the result from the pooled sample

\textsuperscript{36} The Variance Inflation Factor (VIF) scores are below 4.00 in all the six samples, suggesting that the collinearity is within the acceptable level if we take scores beyond 5.00 as a sign of serious collinearity. In addition, the analyses with Age variable left out from the models show that Age50 is still not significant in any of three earnings models. Both results indicate that it is not because of Age50’s high collinearity with Age that the asserted effect of its curvilinearity fails to show up.

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data, in spite of the fact that all the coefficients of this variable for the other samples are consistently negative. This might be a good sign of the existence of a weak relationship between marital status and earnings loss. The coefficient for the pooled sample is -13.57 and significant at .05 level. That is, for the pooled sample, the current married displaced workers suffered $13.57 less earnings loss than the workers whose marital status was otherwise.

The adjusted $R^2$s--37.5%, 35.6%, 34.2%, 30.5%, 31.9% and 34.6%, for the six panels of data, respectively--suggest that the ordinary least square regression analysis of the current model explains a substantial amount of variance. $F$-ratios for all the samples are significant at .001 level. These estimates suggest a fairly decent goodness of fit of the current model.

VI.3. Results from the Percent Lost Model

Now let us compare the above results from the Earnings Change Model with the results from the Percent Lost model in Table 6-4. As indicated in the previous chapter, the dependent variable Percent Lost is the difference between the pre- and post-displacement earnings expressed as a percent of the pre-displacement earnings. For this variable, the positive percentage values mean earnings loss while the negative percentage values mean earnings gain. In comparison with the dependent variable of the previous model--Earnings Change--which is an absolute change in dollars between two earnings, Percent Lost is earnings changes expressed in relative terms with the

VI. FINDINGS FROM THE EARNINGS LOSS MODELS
Table 6-4.
THE OLS REGRESSION COEFFICIENTS FROM THE PERCENT LOST MODEL

<table>
<thead>
<tr>
<th>Independent Variables:</th>
<th>1984 (b)</th>
<th>1986 (b)</th>
<th>1988 (b)</th>
<th>1990 (b)</th>
<th>1992 (b)</th>
<th>POOLED (b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subordinate Segment</td>
<td>.96</td>
<td>6.09*</td>
<td>11.09***</td>
<td>8.80*</td>
<td>6.01</td>
<td>7.86***</td>
</tr>
<tr>
<td>Core Segment</td>
<td>-1.69</td>
<td>4.98</td>
<td>2.13</td>
<td>-.48</td>
<td>-3.62</td>
<td>-.63</td>
</tr>
<tr>
<td>Move</td>
<td>1.10</td>
<td>-.226</td>
<td>.39</td>
<td>4.38</td>
<td>4.42</td>
<td>.59</td>
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<tr>
<td>Move X Subordinate</td>
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<td>9.99</td>
<td>.80</td>
<td>3.68</td>
<td>-5.75</td>
<td>4.60</td>
</tr>
<tr>
<td>Earnings Before</td>
<td>.13***</td>
<td>.11***</td>
<td>.08***</td>
<td>.08***</td>
<td>.07***</td>
<td>.08***</td>
</tr>
<tr>
<td>Education</td>
<td>-2.69***</td>
<td>-2.73***</td>
<td>-1.75*</td>
<td>-2.66***</td>
<td>-1.89**</td>
<td>-1.72***</td>
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<tr>
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<td>.75*</td>
<td>.68***</td>
<td>.69***</td>
<td>.28</td>
<td>.52*</td>
<td>.61***</td>
</tr>
<tr>
<td>Occupational Change</td>
<td>9.35*</td>
<td>9.83***</td>
<td>2.44</td>
<td>10.31**</td>
<td>8.57*</td>
<td>7.86***</td>
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<tr>
<td>Industrial Change</td>
<td>15.06***</td>
<td>8.37**</td>
<td>10.41*</td>
<td>6.23</td>
<td>17.99***</td>
<td>11.01***</td>
</tr>
<tr>
<td>Expected or Notified</td>
<td>1.87</td>
<td>1.20</td>
<td>-9.15**</td>
<td>-3.09</td>
<td>2.01</td>
<td>-1.15</td>
</tr>
<tr>
<td>Year Displaced</td>
<td>7.07***</td>
<td>3.88***</td>
<td>4.93***</td>
<td>5.36***</td>
<td>5.07***</td>
<td>5.46***</td>
</tr>
<tr>
<td>Weeks No Work</td>
<td>.39***</td>
<td>.19***</td>
<td>.19*</td>
<td>.23**</td>
<td>.16*</td>
<td>.25***</td>
</tr>
<tr>
<td>Hours Worked</td>
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<td>-1.30***</td>
<td>-.76***</td>
<td>-.81***</td>
<td>-.89***</td>
<td>-.98***</td>
</tr>
<tr>
<td>Nonwhite</td>
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<td>.82</td>
<td>-2.05</td>
<td>-3.27</td>
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<td>-2.03</td>
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<td>13.18***</td>
<td>5.75</td>
<td>3.27</td>
<td>7.52***</td>
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<td>.45</td>
<td>.32</td>
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<td>.08</td>
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<td>Age50</td>
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<td>-.24</td>
<td>6.74</td>
<td>1.53</td>
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<td>-2.64</td>
<td>-1.82</td>
<td>-2.74</td>
<td>-2.98*</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>1.50</td>
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<tr>
<td>(Constant)</td>
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<td>18.46</td>
<td>-22.72</td>
<td>-15.70</td>
<td>51.06</td>
<td>-23.33***</td>
</tr>
<tr>
<td>Adjusted R²</td>
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<td>.362</td>
<td>.236</td>
<td>.261</td>
<td>.252</td>
<td>.268</td>
</tr>
<tr>
<td>F-ratio</td>
<td>16.42***</td>
<td>24.36***</td>
<td>11.89***</td>
<td>12.04***</td>
<td>12.42***</td>
<td>75.03***</td>
</tr>
<tr>
<td>N</td>
<td>629</td>
<td>924</td>
<td>634</td>
<td>565</td>
<td>611</td>
<td>3407</td>
</tr>
</tbody>
</table>

*p < .05; **p < .01; ***p < .001.

VI. FINDINGS FROM THE EARNINGS LOSS MODELS

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pre-displacement earnings as reference.

For the Subordinate Segment variable in this model, like in the Earnings Change model, the coefficients are positive and significant for the 1986, 1988, 1990 samples and the pooled sample. They are not significant for the 1984 and 1992 samples. The coefficient values of this variable for the former four samples show that the workers displaced from the subordinate segment suffered 6.1%, 11.1%, 8.8% and 7.9% more earnings loss than did their counterparts from the independent segment, for the 1986, 1988 and 1990 surveys, respectively. However, the coefficients of the variable Core Segment for all the six samples indicate that there is no difference in the percent earnings loss between the workers from the core industrial segment and from peripheral industrial segment. It is consistent with the findings from this variable in the Earnings Change model. These two findings may be due to the uniqueness of this study, i.e., it uses the workers’ prior labor market and industrial segmentation characteristics to predict their economic outcome following displacement. In contrast, previous literature on dual industrial segmentation usually used the industrial segments to predict the occupational mobility or workers’ economic outcome in the internal labor market. In the case of the present study, a distinction between these two variables becomes important. That is, the attributes of labor market segments such as occupation-specific skills, vocational training, working habits and so on have been internalized and become part of characteristics of workers, which are carried by the workers when they leave the internal labor market; in contrast, the attributes of

VI. FINDINGS FROM THE EARNINGS LOSS MODELS
industrial segments, such as the degree of oligopolisticity, state involvement and level of technological and financial intensity, are external to the workers; when the workers are displaced, they do not carry these attributes with them to the external labor markets. Therefore, for the displaced workers, the characteristics of the previous labor market segments are of greater importance than those of the previous industrial segments in determining their earnings following displacement.

As in the Earnings Change model, similar results are found for the variable Move and Move x Subordinate in the Percent Lost model. That is, migration neither made a significant difference in earnings loss for the displaced manufacturing workers as a whole nor had a differential effect on the percent loss between the workers from the two distinctive labor market segments. In short, migration has no impact of any kind on earnings changes.

Consistent with the Earnings Change model, the coefficients of the variable Earnings Before are all positive and significant at .001 level. This means that for every additional dollar the displaced workers made at their pre-displacement job, their earnings now were .13%, .11%, .08%, .08%, .07% and .08% lower than the pre-displacement earnings, for the 1984, 1986, 1988, 1990, 1992 and the pooled samples, respectively.

Negative and significant coefficients for Education are found for all the six samples, meaning that each additional year of general school education reduced earnings loss by 2.69%, 2.73%, 1.75%, 2.66%, 1.90% and 1.93%, for the six

VI. FINDINGS FROM THE EARNINGS LOSS MODELS
samples, respectively. In contrast, the coefficients of the variable *Tenure* are positive and significant for all the samples except for the 1990 sample. This result is consistent with that from the *Earnings Change* model in a sense that for the 1990 sample, the causal relationship between tenure and percent loss of earnings is the weakest of all. Literally, these coefficient values mean that the displaced workers lost .75%, .68%, .69%, .52% and .61% of their pre-displacement earnings at the current job for each additional year they spent on the pre-displacement jobs, for the 1984, 1986, 1988, 1992 and pooled samples, respectively. Again these two results together confirm that the general school education and job specific investment, as two distinctive human capital variables, have just opposite impact on the post-displacement earnings of the displaced manufacturing workers.

As in the *Earnings Change* model, the results for the occupational and industrial changes also confirm the hypothesis. For the 1984, 1986, 1990, 1992 and pooled data, the coefficients of the *Occupational Change* variable indicate the displaced workers whose occupations at their current jobs differ from their former ones lost 9.35%, 9.83%, 10.32%, 8.57% and 7.86% of their pre-displacement earnings at their current job for the respective samples. For the 1988 data, consistent with the result from the *Earnings Change* model, the coefficient of this variable is not significant. For the 1984, 1986, 1988, 1992, and pooled data, the coefficients of *Industrial Change* represent 15.06%, 8.37%, 10.41%, 17.99% and 11.01% loss of the pre-displacement earnings for the workers whose industry of their

**VI. FINDINGS FROM THE EARNINGS LOSS MODELS**

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current jobs is not the same as their former ones. However, for the 1990 data, the coefficient of this variable is not significant.

The coefficients of Expected or Notified are not significant for any of the panels but the 1988, which is -9.15 and significant at .01 level, suggesting that the advanced knowledge of the layoff reduced the loss in the pre-displacement earnings by 9.15%. This relationship for the 1988 sample is strong enough to make an individual case by itself. That is, this result may be historically specific, because the 1988 survey covers the best economic recovering period over the past twelve years, during which advanced knowledge might have helped lessen the earnings loss with better chances of getting new and comparable jobs. In other words, it indicates an interactive effect between advanced knowledge and economic good years.

The variable Year Displaced in the model is still a good indicator of 'catch-up' time. For one year later the workers were displaced within the five-year survey period, they would correspondingly suffer 7.07%, 3.88%, 4.93%, 5.36%, 5.07% and 5.46% more of the earnings loss at the survey time, for each of the six samples, respectively. The coefficients of Weeks No Work are positive and significant for all the samples. The corresponding coefficients represent .39%, .19%, .19%, .23%, .16%, and .26% loss of their pre-displacement weekly earnings for each additional week that went by without work for each of the six samples, respectively. Regardless of their statistical significance, the small coefficients suggest that the percent loss in earnings caused by the weeks without work is negligible. The coefficient values of

VI. FINDINGS FROM THE EARNINGS LOSS MODELS
*Hours Worked* indicate that the workers reduced their earnings loss by 1.04%, 1.30%, .76%, .81% .89% and .98% for each additional hour they worked per week, for each of the six samples, respectively. The results from both of the variables are consistent with the findings from the *Earnings Change* model.

In regard of the socio-demographic variables in this *Percent Lost* model, the coefficients of the variables *Nonwhite, Age* and *Age50* are not significant across all the six samples. Concerning the gender differentiation in percent earnings loss, the results from the current model indicate that female displaced manufacturing workers suffered 12.37%, 13.18% and 7.52% more than their male counterparts, in the 1986, 1988 and the pooled samples, respectively. They are consistent with those from the *Earnings Change* model. In this model, marriage shows no effect of any kind on the percent earnings loss. This may suggest that the effect of this variable in the *Earnings Change* model for the pooled sample is marginal.

Unlike in the *Earnings Change* model and the *Loss Ratio* model, *Recession* in the current model is not significant. This difference from the other two results may just reflect the differences in composition among these dependent variables. However, any further conjecture beyond this without evidence can be far-fetched.

The adjusted $R^2$s of this model show that this model explains 30.6%, 36.2%, 23.6%, 26.1%, 25.2%, and 26.8% of the variance of the six panels of data, respectively. The *F-ratios* are all significant at .001 level. These estimated parameters suggest that the *Percent Lost* model has reasonably sound goodness of fit.

**VI. FINDINGS FROM THE EARNINGS LOSS MODELS**
VI.4. Results from the Loss Ratio Model

As described in Chapter V, the Loss Ratio is the ratio of pre-displacement earnings to the post-displacement earnings. A value of 1 means that there is no difference between the pre- and post-displacement earnings and thus no loss and no gain; values above 1 mean earnings loss, and the further they beyond 1, the more loss; values below 1 mean earnings gain, and the further they below 1, the more gain in earnings.

This section briefly compares the results from the Loss Ratio model with those from the previous models just to show the effects of which variables are more persistent across the models. Table 6-5 presents the results from this regression model. In the table, we see that the coefficients of Subordinate Segment are positive and significant only for the 1988 and 1990 and pooled samples. For the previous two models, this variable also was significant for the 1984 sample. I interpret this inconsistency between the current model and previous models for this variable as that the importance of the recession for the 1986 survey period was caught by the dependent variable Loss Ratio, since the first three years (1981-83) of this survey period were in the recession.

Consistent with the previous two models, Core Segment, Move and Move x Subordinate in the current model remain non-significant. As in the previous models, Earnings Before is positive and significant at a very high level. The relatively weak coefficient of Education for the 1988 data in the Percent Lost model is further
### Table 6-5.
THE OLS REGRESSION COEFFICIENTS FROM THE LOSS RATIO MODEL

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>1984 (b)</th>
<th>1986 (b)</th>
<th>1988 (b)</th>
<th>1990 (b)</th>
<th>1992 (b)</th>
<th>POOLED (b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subordinate Segment</td>
<td>.156</td>
<td>.127</td>
<td>.203**</td>
<td>.162*</td>
<td>.012</td>
<td>.164***</td>
</tr>
<tr>
<td>Core Segment</td>
<td>.071</td>
<td>.148</td>
<td>.029</td>
<td>.104</td>
<td>.036</td>
<td>.054</td>
</tr>
<tr>
<td>Move</td>
<td>.119</td>
<td>.025</td>
<td>.023</td>
<td>.030</td>
<td>.122</td>
<td>.039</td>
</tr>
<tr>
<td>Move X Subordinate</td>
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<td>.062</td>
<td>.009</td>
<td>.054</td>
<td>-.102</td>
<td>-.022</td>
</tr>
<tr>
<td>Earnings Before</td>
<td>.002***</td>
<td>.002***</td>
<td>.009***</td>
<td>.001***</td>
<td>.009***</td>
<td>.001***</td>
</tr>
<tr>
<td>Education</td>
<td>-.048**</td>
<td>-.038*</td>
<td>-.019</td>
<td>-.029*</td>
<td>-.036*</td>
<td>-.019**</td>
</tr>
<tr>
<td>Tenure</td>
<td>.012</td>
<td>.023***</td>
<td>.016***</td>
<td>.009</td>
<td>.014**</td>
<td>.015***</td>
</tr>
<tr>
<td>Occupational Change</td>
<td>.239**</td>
<td>.312***</td>
<td>.102</td>
<td>.158*</td>
<td>.258***</td>
<td>.199***</td>
</tr>
<tr>
<td>Industrial Change</td>
<td>.289**</td>
<td>.196*</td>
<td>.220***</td>
<td>.173*</td>
<td>.308***</td>
<td>.215***</td>
</tr>
<tr>
<td>Expected or Notified</td>
<td>-.027</td>
<td>.047</td>
<td>-.175***</td>
<td>-.035</td>
<td>.021</td>
<td>-.032</td>
</tr>
<tr>
<td>Year Displaced</td>
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<td>.036</td>
<td>.048**</td>
<td>.007</td>
<td>.092***</td>
<td>.054**</td>
</tr>
<tr>
<td>Weeks No Work</td>
<td>.008***</td>
<td>.003**</td>
<td>.003***</td>
<td>.002</td>
<td>.002</td>
<td>.004***</td>
</tr>
<tr>
<td>Hours Worked</td>
<td>-.034***</td>
<td>-.042***</td>
<td>-.018***</td>
<td>-.024***</td>
<td>-.024***</td>
<td>-.027***</td>
</tr>
<tr>
<td>Nonwhite</td>
<td>-.108</td>
<td>.024</td>
<td>.037</td>
<td>-.097</td>
<td>.019</td>
<td>-.064</td>
</tr>
<tr>
<td>Female</td>
<td>-.034</td>
<td>.308***</td>
<td>.145*</td>
<td>.087</td>
<td>.024</td>
<td>.108***</td>
</tr>
<tr>
<td>Age</td>
<td>-.009</td>
<td>-.007</td>
<td>.001</td>
<td>-.003</td>
<td>-.005</td>
<td>-.002*</td>
</tr>
<tr>
<td>Age50</td>
<td>.193</td>
<td>.095</td>
<td>-.049</td>
<td>.072</td>
<td>-.095</td>
<td>.260</td>
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<td>-.050</td>
<td>.036</td>
<td>-.082</td>
<td>-.039</td>
<td>-.056</td>
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<td></td>
<td></td>
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<td>2.397***</td>
<td>1.261***</td>
<td>1.702***</td>
<td>2.604***</td>
<td>1.301***</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>.227</td>
<td>.244</td>
<td>.263</td>
<td>.203</td>
<td>.226</td>
<td>.249</td>
</tr>
<tr>
<td>F-ratio</td>
<td>14.03***</td>
<td>17.55***</td>
<td>13.50***</td>
<td>8.98***</td>
<td>10.91***</td>
<td>60.66***</td>
</tr>
<tr>
<td>N</td>
<td>629</td>
<td>924</td>
<td>634</td>
<td>565</td>
<td>611</td>
<td>3407</td>
</tr>
</tbody>
</table>

*p < .05; **p < .01; ***p < .001.

VI. FINDINGS FROM THE EARNINGS LOSS MODELS 143
reduced to no significance in the present model. Together with the results for
Education from the previous models, the result from the current suggests that during
the economically good years, the labor market is less competitive and thus general
education is not as important as during the economically bad years. Although Tenure
was found with a relatively weak positive effect on Loss Ratio for the 1984 and 1990
samples in the previous models, it becomes non-significant for these two samples in
the current model. Occupational change and Industrial Change are positive and
significant in all the data except for Occupational Change in the 1988 data. Consistent
with the previous models, Expected or Notified is highly significant in the expected
direction for the 1988 data only. Surprisingly, Year Displaced is not significant for
the 1986 and 1990 data although it remains significant for the rest of the panels. The
coefficients of Hours Worked remain highly significant with the consistent negative
signs as the prior models for all the data.

Among the socio-demographic variables, the coefficients of Nonwhite show no
effect of any kind on Loss Ratio; which is consistent with the Percent Lost model but
not with the Earnings Change model. However, being female has positive effect on
the Loss Ratio for the 1986, 1988 and pooled data, but not for the 1984, 1990 and
1992, which exactly duplicates the outcomes of the prior two models; of the two age
variables in the current model, neither is significant across these samples, except for
Age in the pooled data. Marital Status are not significant for any of the panels as in
most of the samples in the previous models.

VI. FINDINGS FROM THE EARNINGS LOSS MODELS
Although there are some minor discrepancies between the Loss Ratio model and previous two models, the major findings are consistent across these models. This is a sign of reliability of the dependent variables of these models, i.e., to a large degree they measure the same dimension of the loss the displaced workers suffered. The goodness of fit of the current model remains fairly good as indicated by the adjusted $R^2$s and corresponding $F$-ratios: The model explains 27.2%, 24.4%, 26.2%, 20.3%, 22.6% and 24.9% of variance of the six panels of data, respectively; the $F$-ratios for all the models are significant at .001 level.

VI. FINDINGS FROM THE EARNINGS LOSS MODELS
CHAPTER VII

FINDINGS FROM THE JOBLESS DURATION MODEL

VII.1. Results from the Jobless Duration Model with the Unrestricted Samples

As discussed in the methodology chapter, the employment status unrestricted samples include all those displaced workers who were still in the labor force regardless of their current employment status. There are two employment status possibilities: One is reported "working" regardless of the difference in the number of hours worked and the other is reported "looking for job". Presumably, the employment status unrestricted samples defined as such are more representative of the population than the employment status restricted samples that only include those who reported working at the survey time. However, the trade-off of the employment status restricted samples is that they provide the jobless duration model with a less skewed dependent variable by excluding those workers who were still unemployed at the survey time, which largely pulls the jobless duration upward in the unrestricted samples. Thus, differences between the results from these two samples are worth comparing.

The Ordinary Least Square (OLS) regression coefficients with the employment status unrestricted samples are presented in Table 7-1. The constants in the table show that even if holding constant all the independent variables in the model, the displaced manufacturing workers still experienced an average of 51, 56, 22, 12, 75, and 29
Table 7-1.  
THE OLS REGRESSION COEFFICIENTS FROM THE JOBLESS DURATION MODEL  
FOR THE EMPLOYMENT STATUS UNRESTRICTED SAMPLES

<table>
<thead>
<tr>
<th>Independent Variables:</th>
<th>1984 (b)</th>
<th>1986 (b)</th>
<th>1988 (b)</th>
<th>1990 (b)</th>
<th>1992 (b)</th>
<th>POOLED (b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subordinate Segment</td>
<td>9.60***</td>
<td>7.86***</td>
<td>4.62*</td>
<td>3.79*</td>
<td>3.95*</td>
<td>7.49***</td>
</tr>
<tr>
<td>Core Segment</td>
<td>8.31***</td>
<td>5.95*</td>
<td>5.61*</td>
<td>3.08</td>
<td>3.05</td>
<td>5.68***</td>
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<td>Move</td>
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<td>-1.28</td>
</tr>
<tr>
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<td>5.14</td>
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<td>5.72</td>
<td>1.91</td>
<td>-11.42**</td>
<td>3.20</td>
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<td>.00</td>
<td>-.00</td>
<td>.00</td>
<td>.01</td>
<td>.004*</td>
</tr>
<tr>
<td>Education</td>
<td>-.94*</td>
<td>-.82*</td>
<td>-.28</td>
<td>-.11</td>
<td>-.131**</td>
<td>-.20***</td>
</tr>
<tr>
<td>Tenure</td>
<td>.51**</td>
<td>.30*</td>
<td>.24</td>
<td>.26*</td>
<td>.09</td>
<td>.26***</td>
</tr>
<tr>
<td>Expected or Notified</td>
<td>-.39</td>
<td>-3.37*</td>
<td>-1.38</td>
<td>-.25</td>
<td>-4.07*</td>
<td>-2.51**</td>
</tr>
<tr>
<td>Year Displaced</td>
<td>-5.39***</td>
<td>-6.25***</td>
<td>-1.88**</td>
<td>-1.44*</td>
<td>-2.35***</td>
<td>-3.10***</td>
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<tr>
<td>Nonwhite</td>
<td>8.36**</td>
<td>9.47***</td>
<td>4.05</td>
<td>3.69</td>
<td>1.21</td>
<td>6.03***</td>
</tr>
<tr>
<td>Female</td>
<td>-.19</td>
<td>-.58</td>
<td>2.63</td>
<td>1.45</td>
<td>1.25</td>
<td>.19</td>
</tr>
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<td>Age</td>
<td>.06</td>
<td>.10</td>
<td>.04</td>
<td>.23</td>
<td>.05</td>
<td>.08</td>
</tr>
<tr>
<td>Age50</td>
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<td>3.87</td>
<td>.91</td>
<td>5.01</td>
<td>2.05</td>
</tr>
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<td>-2.17</td>
<td>-2.24*</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>7.57***</td>
</tr>
<tr>
<td>(Constant)</td>
<td>50.87***</td>
<td>56.43***</td>
<td>22.24**</td>
<td>12.44</td>
<td>75.08***</td>
<td>28.88***</td>
</tr>
<tr>
<td>Adjusted R²</td>
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<td>.131</td>
<td>.051</td>
<td>.044</td>
<td>.055</td>
<td>.093</td>
</tr>
<tr>
<td>F-ratio</td>
<td>9.76***</td>
<td>13.69***</td>
<td>4.05***</td>
<td>3.33***</td>
<td>4.46***</td>
<td>35.20***</td>
</tr>
<tr>
<td>N</td>
<td>1,112</td>
<td>1,179</td>
<td>800</td>
<td>712</td>
<td>837</td>
<td>5,026</td>
</tr>
</tbody>
</table>

*p < .05; **p < .01; ***p < .001.

VII. FINDINGS FROM THE JOBLESS DURATION MODEL
weeks for the 1984, 1986, 1988, 1990, 1992 and pooled samples, respectively. A mere eyeballing gives a picture of an apparent pattern across these years, which suggests that jobless duration responds closely to the cyclical changes in labor demand. In other words, holding everything else constant, in the surveys which cover the recession years such as 1984, 1986, and 1992, average durations of weeks without job were substantially longer than in the surveys which include economic recovery years.

The first row of Table 7-1 shows that the regression coefficients for the variable *Subordinate Segment* are consistently positive and significant across the six samples, although confidence levels vary across the samples. These coefficients mean that workers displaced from the subordinate primary segment had an average of 9.6, 7.9, 4.6, 3.8, 3.9 and 7.5 weeks longer of the jobless duration than those from the independent primary segment for each of the six samples, respectively. This finding confirms the hypothesis that the attributes of the subordinate primary segment have negative impact on workers' post-displacement employment opportunities.

The regression coefficients of the variable *Core Segment* are positive for all samples and significant for the 1984, 1986, 1988 and pooled samples. Literally these coefficients mean that workers displaced from the core segment suffered an average of 8.3, 5.9, 5.6, and 5.7 weeks longer of jobless duration than those from the peripheral segment, in the 1984, 1986, 1988 and pooled samples, respectively. In comparison with the corresponding variable in the earnings loss models, whose impact

**VII. FINDINGS FROM THE JOBLESS DURATION MODEL**
is negligible across all the samples except for the pooled one, industrial segmentation
seems to have exerted a major impact on workers' post-displacement jobless duration.
My interpretation of this differential is that although the characteristics of the core
industries are not transferable with the workers so as to affect their post-displacement
earnings level, the variable is a good proxy for the decline of core manufacturing
industries. It is this decline that made workers displaced from the core segment take
longer to find jobs and have more difficulties locating jobs than those from the
peripheral segment. In short, being from the core segment had a more direct impact
on workers' jobless duration than on their earnings loss.

The coefficients of the Move variable are non-significant in all the samples for
the current model. And the coefficients of the Move x Subordinate variable are also
non-significant in all the samples, except for in the 1992 one.\textsuperscript{37} Its coefficient,
significant at the .01 confidence level, suggests that among the displaced
manufacturing workers in the 1992 survey, migration following displacement
shortened the jobless duration by 11.4 weeks for those from the subordinate primary
segment, compared to the independent primary segment. This result disconfirms the
hypothesis of this thesis.

\textsuperscript{37} The coefficients of Move X Core that substitutes for Move X Subordinate in the
jobless duration model are not statistically significant in any of the samples. The
coefficients' directions and values of other variables in the model are not substantially
different from those in the original one, either. The \textit{adjusted-$R^2$s} for all the samples
show no improvement on the goodness of fit. Thus to avoid redundancy, the results
from the model with this substitution are not presented.

VII. FINDINGS FROM THE JOBLESS DURATION MODEL
The coefficients for the *Earnings Before* variable is not significant for any of the samples, except for the pooled one, at .05 confidence level, meaning that the effect of the previous earnings level on the post-displacement jobless duration is marginal. With the evidence from one survey, we may not be able to claim that strong support has been found for the reservation wages hypothesis that workers with higher previous earnings tend to take longer to locate jobs because they have higher earnings expectations. Instead, what we can claim should be very modest: If the previous earnings had any positive effect on the jobless duration following displacement, the effect is fairly weak.

Regarding the impact of formal educational attainment on the jobless duration, the coefficients of the *Education* variable show that in the 1984, 1986, 1992 and pooled samples, for every additional year of schooling completed, the displaced workers would experience an average .9, .8, 1.3 and .2 week of jobless duration shorter following displacement. However, such effect is not found in the 1988 and 1990 surveys. Again, this differential of formal education across the surveys should be attributed to the variation in labor market demand between the recession and non-recession periods of the past decade. During the recession period, the labor market is stagnant and thus tends to more discriminatory to the labor in terms of education, while during the non-recession period or economic recovery years, labor market demand is more diverse and thus workers can find jobs that required various levels of formal educational attainments. As predicted, the effect of the work tenure is just

VII. FINDINGS FROM THE JOBLESS DURATION MODEL
opposite to that of formal education. The coefficients of the Tenure variable for the 1984, 1986, 1990 and pooled samples, show that for every additional year of work tenure on the previous job, the displaced workers suffered .5, .3, .3, .3 week longer of jobless duration. Again during the worst years in economy covered by the 1984 survey, such an effect is substantially stronger than during the other surveys.

The coefficients of the variable Expected or Notified suggest that impact of the advanced knowledge about the impending lay-off was not at all consistent across the samples. Its effect is time-specific. For the 1986, 1992, and the pooled samples, the advanced knowledge reduced the jobless duration by 3.4, 4.1 and 2.5 weeks. The findings from these surveys support the hypothesis that advanced knowledge of displacement started people on job search earlier and thus resulted in shorter jobless duration following displacement.

The Year Displaced being a control variable, its coefficients are significant across all the samples, with the ones from the 1988 and 1990 samples significant at a relatively lower confidence level. As discussed in the development of hypothesis, this result should be understood as an artifact of the arbitrary cutting point of the survey period. That is, since the later the displacement occurred in the survey period and the closer it is to the survey closing date, the jobless duration as recorded in the data would appear shorter regardless of the real length of jobless duration. As expected, the results confirm that this variable should be considered in the model specification.

Among the socio-demographic variables, race seems to be an important factor

VII. FINDINGS FROM THE JOBLESS DURATION MODEL
differentiating jobless duration. The coefficients of the variable *Nonwhite* are negative and significant for the 1984, 1986 and pooled data, respectively. Interpreted literally, nonwhite displaced workers suffered an average of 8.4, 9.5, 6.0 weeks longer of jobless duration following displacement than their White counterparts, for these three samples, respectively, holding everything else constant.

Of other socio-demographic variables such as *Female, Age, Age50*, none shows significant importance on the post-displacement jobless duration. The coefficients of the variable *Marital Status* are statistically significant at .05 confidence level for the 1984 and pooled sample only. Literally, they mean that the currently married displaced workers would experience 5.1 and 2.2 weeks shorter of jobless duration than those whose marital status was otherwise, for the 1984 and pooled data, respectively. It may suggest that married displaced workers are less likely to wait long for good jobs relative to those whose marital status is otherwise due to the domestic financial pressure. Since in addition to the 1984 sample, this effect only appears in the pooled sample, this seems to be a relatively weak relationship only pronounced in the large sample.

Confirming the hypothesis that recessions had their own effect on jobless duration, the coefficient of the *Recession* variable is positive and significant at .001 confidence level. Its value indicates that the workers displaced during the recession years experienced an average of 7.6 weeks longer a jobless spell than their counterparts displaced during the non-recession years.

**VII. FINDINGS FROM THE JOBLESS DURATION MODEL**
The adjusted $R^2$s show that this Jobless Duration model explains 8.3%, 12.2%, 8.7%, 5.1%, 7.9% and 9.5% of the total variance of the jobless duration, for each of the six samples, respectively. Together with the $F$-ratios for all the samples, these percentages of variance explained suggest that the overall goodness of fit of the current model is moderate.

VII.2. Results from the Jobless Duration Model with the Restricted Samples

As stated in the methodology chapter, the purpose of examining the Jobless Duration model with the samples of only those who were reemployed at the survey time is to close the open end of jobless duration in the samples with both reemployed and unemployed workers so as to increase the comparability within the samples. With this control of employment status, the results will be presented in comparison with the results from the test of this model with unrestricted samples. Table 7-2 presents the OLS regression coefficients from this test.

As with the unrestricted samples, the regression coefficients of the Subordinate Segment variable remain significant in the predicted direction, but the coefficient values are lower across the six samples so that it becomes non-significant for the 1990 sample. The same lowering effect is found for the Core Segment variable, although those coefficients positive and significant in the unrestricted samples remain significant in the same direction in the current samples. Among the displaced

VII. FINDINGS FROM THE JOBLESS DURATION MODEL
Table 7-2.
THE OLS REGRESSION COEFFICIENTS FROM THE JOBLESS DURATION MODEL FOR THE SAMPLES OF THE CURRENTLY REEMPLOYED WORKERS

<table>
<thead>
<tr>
<th>Independent Variables:</th>
<th>1984 (b)</th>
<th>1986 (b)</th>
<th>1988 (b)</th>
<th>1990 (b)</th>
<th>1992 (b)</th>
<th>POOLED (b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subordinate Segment</td>
<td>8.19***</td>
<td>7.16**</td>
<td>4.33*</td>
<td>1.86</td>
<td>7.29**</td>
<td>6.74***</td>
</tr>
<tr>
<td>Core Segment</td>
<td>6.25*</td>
<td>5.52*</td>
<td>5.74*</td>
<td>3.06</td>
<td>2.32</td>
<td>5.39***</td>
</tr>
<tr>
<td>Move</td>
<td>2.25</td>
<td>-3.26</td>
<td>2.16</td>
<td>-.83</td>
<td>6.62*</td>
<td>-.50</td>
</tr>
<tr>
<td>Move X Subordinate</td>
<td>1.94</td>
<td>3.15</td>
<td>8.51*</td>
<td>3.44</td>
<td>-14.46**</td>
<td>2.58</td>
</tr>
<tr>
<td>Earnings Before</td>
<td>.02**</td>
<td>.00</td>
<td>.00</td>
<td>-.00</td>
<td>.01*</td>
<td>.00</td>
</tr>
<tr>
<td>Education</td>
<td>-1.24**</td>
<td>-.74</td>
<td>-.16</td>
<td>-.17</td>
<td>-1.00*</td>
<td>-.19***</td>
</tr>
<tr>
<td>Tenure</td>
<td>.52**</td>
<td>.13</td>
<td>.35**</td>
<td>.23*</td>
<td>.19</td>
<td>.25***</td>
</tr>
<tr>
<td>Expected or Notified</td>
<td>.04</td>
<td>-3.51</td>
<td>-.52</td>
<td>-1.08</td>
<td>-2.88</td>
<td>-2.20**</td>
</tr>
<tr>
<td>Year Displaced</td>
<td>-4.93***</td>
<td>-6.45***</td>
<td>-2.93***</td>
<td>-2.26***</td>
<td>-3.07***</td>
<td>-3.40***</td>
</tr>
<tr>
<td>Nonwhite</td>
<td>4.32</td>
<td>9.84***</td>
<td>3.32</td>
<td>2.80</td>
<td>2.17</td>
<td>4.20***</td>
</tr>
<tr>
<td>Female</td>
<td>3.74</td>
<td>.24</td>
<td>6.38**</td>
<td>3.43*</td>
<td>4.17*</td>
<td>2.56**</td>
</tr>
<tr>
<td>Age</td>
<td>-.01</td>
<td>.15</td>
<td>-.01</td>
<td>.17</td>
<td>-.05</td>
<td>.04</td>
</tr>
<tr>
<td>Age50</td>
<td>-4.99</td>
<td>-2.58</td>
<td>2.85</td>
<td>1.52</td>
<td>6.10</td>
<td>1.22</td>
</tr>
<tr>
<td>Marital Status</td>
<td>-4.66*</td>
<td>-2.73</td>
<td>2.47</td>
<td>-.14</td>
<td>-.80</td>
<td>-1.14</td>
</tr>
<tr>
<td>Recession</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7.83***</td>
</tr>
<tr>
<td>(Constant)</td>
<td>51.54***</td>
<td>55.91***</td>
<td>22.44**</td>
<td>18.15*</td>
<td>60.40***</td>
<td>28.82***</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>.083</td>
<td>.122</td>
<td>.087</td>
<td>.051</td>
<td>.079</td>
<td>.095</td>
</tr>
<tr>
<td>F-ratio</td>
<td>6.88***</td>
<td>11.22***</td>
<td>5.91***</td>
<td>3.48***</td>
<td>5.20***</td>
<td>31.35***</td>
</tr>
<tr>
<td>N</td>
<td>916</td>
<td>1,027</td>
<td>720</td>
<td>712</td>
<td>690</td>
<td>4,3321</td>
</tr>
</tbody>
</table>

*p < .05; **p < .01; ***p < .001.

VII. FINDINGS FROM THE JOBLESS DURATION MODEL
manufacturing workers who were reemployed at the time of survey, those from the subordinate primary segment experienced significantly longer jobless duration than their counterparts from the independent primary segment; and those from the core industries experienced longer jobless duration than their counterparts from the peripheral sector. In short, for the reemployed workers, both being from subordinate labor market segment and being from core industrial segment had prolonging effect on jobless duration. These results further confirm the findings from the unrestricted samples.

Migration effects on jobless duration are complex among the reemployed displaced manufacturing workers, although they remain non-significant across most of the samples. The coefficient of the variable Move becomes positive and significant at .05 confidence level for the 1992 survey. The coefficient value means that for the workers from the independent primary segment, migration lengthened the jobless duration by 6.6 weeks on average. As in the unrestricted sample for the 1992 survey, the interaction term between migration and subordinate segment is still negative and significant at .01 confidence level. It implies that among the reemployed displaced manufacturing workers from the 1992 survey, migration shortened the jobless duration by 14.5 weeks for the workers from the subordinate primary segment, compared to those from the independent primary segment. Again, consistent with the unrestricted sample, this finding is contradictory to the hypothesis, which postulates that workers from the independent primary segment would benefit from migration,

VII. FINDINGS FROM THE JOBLESS DURATION MODEL
rather than the workers from the subordinate primary segment. In contrast, for the
1988 survey, as expected by the hypothesis, the coefficient from the interaction term
between migration and subordinate primary segment is positive and significant at .05
confidence level. The coefficient suggests that among the reemployed displaced
manufacturing workers in the 1988 survey, migration resulted in 8.5 weeks longer of
jobless duration for the workers from the subordinate primary segment than for their
counterparts from the independent primary segment. In sum, these inconsistent
findings suggest that if migration has any effect on jobless duration, it is sample-
specific, and lacks a general pattern across the samples.

In contrast with the test of the model with the unrestricted samples, in which
the coefficient of the Earnings Before variable is only significant for the pooled data,
the regression coefficients of the Earnings Before variable are positive and significant
for the restricted 1984 and 1992 samples, respectively, but not for the pooled data.
Literally they suggest that among the displaced manufacturing workers who were
reemployed in the 1984 and 1992 surveys, every additional dollar the workers made
at their previous jobs led to an increase of .02 and .01 week of jobless duration.
However, their effects are so small that they do not actually mean anything substantial
although they are statistically significant.

The educational attainment seems to have its effect with the same pattern as
the previous earnings. That is, education attainment seemed to shorten the jobless
duration only in the surveys that cover the recessions. Although with the unrestricted

VII. FINDINGS FROM THE JOBLESS DURATION MODEL
samples, the coefficients of the *Education* variable are significant in the 1984, 1986, 1992 and pooled data, with the restricted samples the coefficients are only significant in the 1984, 1992 and pooled data. The coefficient values mean that among the reemployed displaced manufacturing workers in 1984, 1992, and pooled samples, for every additional year of schooling completed, the workers' jobless duration was shortened by 1.2, 1.0 and .2 week, respectively. The reason why the coefficient for education is substantially smaller in the pooled sample than in the other two samples, is perhaps because the variance is largely reduced by the other three samples, in which education has no significant impact on jobless duration, when the data are pooled.

As predicted, the coefficients of the *Tenure* variable are positive and significant, but only for the 1984, 1988, 1990 and pooled surveys, while in the model with the unrestricted samples, the *Tenure* variable is significant for the 1984, 1986, 1990 and pooled samples. The discrepancy is obviously related to the different sample selection. The coefficients indicate that among the workers who had completed their jobless duration at the survey time, for every additional year of work tenure, the jobless duration would prolong by .5, .4, .2 and .3 weeks in the 1984, 1988, 1992 and pooled samples, respectively. Again, the findings from the pooled samples suggest that for the displaced manufacturing workers, educational attainment and work tenure had opposite effects on the jobless duration as they did on the earnings losses.

**VII. FINDINGS FROM THE JOBLESS DURATION MODEL**
In the unrestricted samples, the negative effect of the *Expected or Notified* variable on jobless duration is found at least in the 1986 and 1990 data as well as in the pooled data. In the restricted samples, however, this effect appears only in the pooled sample. It means that for the reemployed displaced manufacturing workers as a whole, the advanced knowledge of displacement did have a negative impact on jobless duration.

*Year Displaced* as a control variable in the model in the restricted samples has results consistent with those in the unrestricted samples. That is, it is negative and significant across all the samples. Again, the results strongly confirm the importance of incorporating this variable in the model. The coefficients of *Nonwhites* show that among the reemployed displaced manufacturing workers being nonwhites resulted in longer jobless duration relative to being whites in the 1986 and pooled samples.

The most interesting difference between the results from the unrestricted and restricted selections of samples is for the *Female* variable. With the unrestricted samples, gender is not an important differentiating factor on jobless duration. In other words, among the displaced manufacturing workers, reemployed and unemployed as a whole, being female did not result in longer jobless duration. Among the reemployed displaced manufacturing workers, however, the coefficients of the *Female* variable are positive and statistically significant for the 1988, 1990, 1992 and pooled samples. That is, for the reemployed workers, gender becomes an important differentiating factor on jobless duration. The coefficients literally means that being female led to an

**VII. FINDINGS FROM THE JOBLESS DURATION MODEL**
average of 6.4, 3.4, 4.2, and 2.6 weeks longer of jobless duration than being male, at least in the 1988, 1990, 1992 and pooled samples, respectively. The question is how the difference between the two selections of samples occurred. An examination on the gender difference in labor force participation status following displacement as presented in Table 7-3 may partially answer the question. The Chi-Square tests on the percentage values of the three categories of post-displacement labor market participation status between female and male displaced workers suggest that at the survey time, female workers are significantly more likely to drop out of labor force than male workers, while male workers are significantly more likely to be reemployed as well as significantly more likely to be looking for jobs than female workers. The differences in percent between females and males who were out of labor force range from 11 (1988) to 26 (1984) points across the samples.

In contrast, differences in percent between females and males who were still "Looking for Job" are from 5 (1988) to 7 (1984) points, meaning that roughly 5%-7% more male workers than female workers are found still looking for jobs at the survey time. Differences in percent of the reemployment status range roughly from 6 (1992) to 19 (1984) points across the samples, meaning that 6%-19% more males than females were reemployed at the survey time. With these gender differences in labor force participation status in mind, we reexamine the differential effect of gender on jobless duration between the two conditional samples. To include the workers who are both reemployed and still looking for jobs in the sample, we actually exclude about

VII. FINDINGS FROM THE JOBLESS DURATION MODEL
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female (%)</td>
<td>Male (%)</td>
<td>Female (%)</td>
<td>Male (%)</td>
<td>Female (%)</td>
<td>Male (%)</td>
</tr>
<tr>
<td>Out of Labor Force</td>
<td>257</td>
<td>242</td>
<td>220</td>
<td>178</td>
<td>104</td>
<td>137</td>
</tr>
<tr>
<td></td>
<td>(46.5)</td>
<td>(20.3)</td>
<td></td>
<td>(15.9)</td>
<td>(28.7)</td>
<td>(17.9)</td>
</tr>
<tr>
<td>Looking for Job</td>
<td>39</td>
<td>169</td>
<td>36</td>
<td>125</td>
<td>20</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>(7.1)</td>
<td>(14.2)</td>
<td>(6.4)</td>
<td>(11.2)</td>
<td>(5.5)</td>
<td>(9.2)</td>
</tr>
<tr>
<td>Reemployed</td>
<td>257</td>
<td>783</td>
<td>309</td>
<td>814</td>
<td>238</td>
<td>557</td>
</tr>
<tr>
<td></td>
<td>(46.5)</td>
<td>(65.6)</td>
<td>(54.7)</td>
<td>(72.9)</td>
<td>(65.7)</td>
<td>(72.9)</td>
</tr>
<tr>
<td>Total</td>
<td>553</td>
<td>1,194</td>
<td>565</td>
<td>1,117</td>
<td>362</td>
<td>764</td>
</tr>
<tr>
<td></td>
<td>(100)</td>
<td>(100)</td>
<td>(100)</td>
<td>(100)</td>
<td>(100)</td>
<td>(100)</td>
</tr>
</tbody>
</table>

*Chi-Square tests on percentages across sex are all significant at .001 level.
11%-26% more female workers than male workers. A sample selected like this includes more male workers than female workers who were still looking for jobs (9.2%-16.1% versus 5.0%-9.1% across all the samples). Then, the consequence is that the unemployed male workers are overrepresented in the unrestricted employment status samples, which in turn increases the average length of jobless duration for males and suppresses the variation in jobless duration caused by gender. Because of this suppressing factor, the gender effect on jobless duration with the unrestricted employment status samples fails to appear. In contrast, the restricted employment status samples include only those who were reemployed at the survey time and actually control for this suppressing factor. In other words, this selection rules out the upward bias towards male workers' jobless duration. Thus, the differential effect of gender on jobless duration emerges. In short, in order to avoid deriving misleading conclusions, the report on the findings from this model with these two differently selected samples should be very specific. In this case, the report should be: Among the reemployed displaced workers, females tend to experience longer jobless spells than males in the 1988, 1990, 1992 and pooled samples, while among all the displaced workers who remained in the labor force regardless of their employment status at the survey time, such gender differentiation in jobless duration fails to appear due to the fact that unemployed males tend to stay longer than unemployed females in the labor force.

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Among the rest of the socio-demographic variables including Age, Age50, Marital Status, only Marital Status for the 1984 survey is negative and significant, meaning that the currently married people tended to have shorter duration of joblessness.

Finally, the Recession variable remains highly significant (at .001 confidence level). The coefficient value, which is almost identical with the corresponding one with the unrestricted pooled sample, indicates that workers displaced during a recession year suffered an average of 7.8 weeks longer of the jobless duration than those displaced during a non-recession year, holding everything else constant.

Similar to the model with the unrestricted samples, the adjusted $R^2$s and $F$-ratios suggest that the overall goodness of fit for the jobless duration model with the restricted samples is moderate if not less.

VII. FINDINGS FROM THE JOBLESS DURATION MODEL
CHAPTER VIII
DISCUSSION AND CONCLUSIONS

VIII.1. Summary of the Empirical Findings

For further discussion and generalization in the current chapter, I first summarize the empirical results reported in the previous two chapters:

1) Labor market segmentation as postulated by the new structuralist theorists and as operationalized by the previous studies is important in explaining the labor market outcomes of the displaced manufacturing workers. Workers displaced from the subordinate primary segment suffered more earnings loss and longer jobless duration than their counterparts from the independent primary segment. Although the data fail to confirm that there is a causal relationship between industrial segmentation and earnings loss, workers from the core industrial segment did experience longer jobless duration than their counterparts from the peripheral segment.

2) Since this study is exploring five panels of survey data, which cover a 12-year period of time, some time-specificities are anticipated: The causal effect between the labor market segmentation and earnings loss emerge only from the 1986, 1988, 1990 and pooled data, not from the 1984 and 1992 data. The industrial segmentation in the jobless duration model shows another time-specificity: Although workers from the core segment experienced longer jobless duration than their counterparts from the peripheral segment in the 1984, 1986 and 1988 data, such industrial segmental effect
disappeared in the 1990 and 1992 data.

3) Overall, post-displacement migration neither lessened the earnings loss nor shortened the jobless duration for the displaced manufacturing workers as a whole. Migration did not have a labor-market-segment-based differential effect on the earnings loss and jobless duration, except in the 1988 and 1992 data.

4) Manufacturing workers with higher earnings before displacement tended to lose more earnings both in absolute terms (the Earnings Change model) and relative terms (the Percent Lost and Loss Ratio models) at their post-displacement job.

5) The jobless duration following displacement has a positive effect on earnings loss, i.e., confirming my alternative hypothesis to the negative selectivity hypothesis that the longer the jobless duration the more the earnings loss.

6) The data suggest that on the one hand, the longer the work tenure a worker had on his/her previous job, the more earnings loss and the longer post-displacement jobless duration he/she suffered; on the other, the more school education, the less the earnings loss and shorter jobless duration.

7) When reemployed, those who were in different occupations or industries than their previous ones tended to lose more earnings relative to those who stayed in the same occupations and industries.

8) Advanced knowledge about displacement could not prevent earnings loss but reduced the jobless duration to a moderate degree.

9) Among the reemployed, those displaced earlier within the survey period

VIII. DISCUSSION AND CONCLUSIONS
suffered smaller earnings loss; the longer hours worked, the less the earnings loss.

10) Racial effect on earnings loss is virtually nil, but Nonwhites experienced longer duration of joblessness and their Whites counterparts.

11) Among the reemployed, female displaced workers suffered larger earnings loss and longer duration of joblessness than their male counterparts.

12) There is no overall age impact on either earnings loss or jobless duration. Although weak, there is general trend that currently married displaced workers suffered a smaller earnings loss than unmarried counterparts.

VIII.2. Discussion and Generalization

The first of the main objectives of the current study is to evaluate the effects of changes of the labor market structure on the individual displaced workers from the the deindustrialization and the dynamic labor market segmentation perspectives. The former argues that the U.S. labor market has been further bipolarized during the recent economic restructuring and the latter reinforces that this bipolarization is an inevitable shift of labor market segmentation in its historical progression of capitalism. In this sense, instead of being obsolete due to deindustrialization, labor market segmentation as a historical process is continuing with a new twist. The empirical finding that workers from the subordinate primary segment suffered more earnings loss implies that a tendency of polarization in post-displacement earnings for the displaced workers between the segments exists.

VIII. DISCUSSION AND CONCLUSIONS
My interpretation about the discrepancy between the effects of industrial segmentation on jobless duration and earnings loss is two-fold: On the one hand, unlike the characteristics of the labor market segments which have been internalized into workers and thus can be transferred with the workers when they are leaving their labor market segment, the characteristics of the industrial segments are external to the workers and nontransferable. Once they are displaced, the characteristics of industrial segments such as degree of competitiveness and oligopoly/monopoly are left behind with the firms or industries or disappeared with the firms when the plants were closed or moved and jobs were wiped out. As a matter of fact, this variable is more a proxy of deindustrialization, largely reflecting the shrinking of the American manufacturing industries. Therefore, it predicts jobless duration better than earnings loss. In other words, the core workers are less flexible and less competitive than the peripheral workers facing the turbulence of economic structural change. On the other hand, according to Wallace and Rothschild (1988), deindustrialization in the 1980s has gone into such a depth that manufacturing industries of both core and peripheral sectors are equally devastated or threatened (See Chapter 1). When the core sector began to rely more and more on external labor market measures in their hiring and firing practice so as to lower their labor cost and increase their competitiveness, the peripheral sector becomes even more vulnerable. In short, deindustrialization has its ripple effect on the peripheral sector through its initial damage on the core sector. Therefore, during deindustrialization the workers displaced from both the core and peripheral industrial

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segments are facing the same difficulties recovering their earnings loss following displacement.

Some specificities in the results across data actually represent the general trends through time. For instance, the discrepancy in the causal effects between the labor market segmentation and earnings loss across data actually presents a pronounced pattern which should be regarded as a trend associated with the two major recessions (1981-1984 and 1990-1991) during this period. Given this trend, I conjecture that the recessions could disrupt the causation, i.e., during the recessions, such differentiating effect of labor market segmentation disappeared because the workers displaced from independent and subordinate segments suffered equally in earnings loss. When the data from the five panels are pooled, however, effects of both the labor market segmentation and recessions are important. This indicates that on the one hand, there exists a general trend of differential in earnings loss between the workers from the two segments during the past 12 years; on the other, recessions had their own effects on the earnings loss and jobless duration independent of labor market segmentation. The discrepancy in the effects of industrial segmentation in the jobless duration model across data reflects the fact that during the recent years, the economic restructuring and displacement have deepened into the less core-dominated manufacturing industries as discussed previously.\textsuperscript{38} Thus, the differential

\textsuperscript{38} Comparing across four CPSDWS waves (1984, 1986, 1988 and 1990), Diane Herz (1991) found that although fewer in number, the workers displaced in the late 1980s represented a wider range of industries and occupations than those displaced

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effect of industrial segmentation on jobless duration become less important in the recent years.

With the confirmation of the importance of the labor market segmentation in post-displacement labor market opportunities for the displaced manufacturing workers, we turn to the second of the main objectives of this study: To examine the consequences of post-displacement migration so as to carry on the prolonged debate between human capital and neo-classical perspectives, which have dominated labor migration research, and the new structuralist perspective. From the new structuralist perspective, the current study attempts to distinguish the differential migration effect on the economic outcomes for the displaced workers of two labor market segments. With the evidence from the data, it expects to answer the question: Whether migration is a universal solution to all the workers in a segmented labor market or to the workers in one of the segments? This is the theme that has been long neglected by the research along both the lines of labor migration and new structuralism (Masi 1992). The current study has intended to find evidence to negate the neo-classic and human capital expectation about migration as a solution to the losses of the displaced workers.

The finding seems to confirm that geographic mobility is not a remedy for the losses of displacement for the displaced manufacturing workers as a whole. Instead of confirming the new structuralist argument, however, the data indicate that workers earlier in the decade.

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from the independent primary segment did not benefit significantly more or less from migration than their counterparts from the subordinate primary segment. The current finding is consistent with the finding by DaVanzo and Hosek (1981) from their analysis of PSID data with a sample of nondisplaced migrant workers. Their regression analysis of a pooled sample of migrants and nonmigrants reveals no significant wage differences either in terms of wage-level or wage-change between migrants and nonmigrants when other wage determinants are controlled. Among other things, however, an important difference between the models examined in the current study and the models examined by DaVanzo and Hosek is that in the current study, the time for the occurrence of migration is unknown while in their study, they focus on wages outcomes one year after migration. The authors note that perhaps migration effect on wage will accrue after the first year of migration. However, the CPSDWS data do not allow us to control for the time between migration and survey. Obviously, it is one of the data limitations of this current study, which will be further discussed in the section on limitations of this study.

While asserting that there is no overall migration effect on earnings loss and jobless duration for the displaced manufacturing workers, the specific findings from the 1988 and 1992 data are worth discussing. In contrast with the finding from the 1992 data, the evidence from the 1988 data seems to suggest that for the reemployed displaced manufacturing workers from the subordinate primary segment, migration significantly increased jobless duration. What we can conclude from such pronounced

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contradictory results is that migration effects for the displaced manufacturing workers


contradictory results is that migration effects for the displaced manufacturing workers can be time-specific. Migration seemed favorable towards the workers from the independent primary segment during the 1983-1987 period while the opposite was true during the 1987-1991 period. This may indicate that the labor market for the independent segment workers is becoming more and more unfavorable. This conjecture is consistent with the recent trend of increasingly high unemployment rate of white collar workers.

An overall view of the effects of the prior earnings, education and work tenure on earnings loss and jobless duration provides us with a picture of the relationship between the displaced workers’ prior socio-economic status and post-displacement labor market outcomes. Disconfirming the reservation wages argument, the finding from the current study implies that it was difficult for the displaced manufacturing workers with relatively high wages to find an equally high-paying job after displacement and thus they would lose relatively more in the context of deindustrialization. To acquire a more profundng understanding of this finding, we should bear in mind that historically the American manufacturing industries had powerful mechanisms of internal labor markets before deindustrialization, which led to distorted non-market wages in major core manufacturing industries, such as automobile and steel industries. The high pre-displacement wages in American manufacturing industries were largely an indicator of this non-market distortion. During the economic restructuring, however, what displaced workers were more

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likely to face was a labor market with market-oriented wages and flexible employment practice. Thus, the more the workers benefited from the pre-displacement internal market wages, the more striking would be the earnings differences.

The negative selectivity hypothesis, which argues that the earlier the reemployment, the lower the current earnings, is actually the flip of the "reservation wages" coin. Against it, I provide an alternative interpretation for the relationship between duration of joblessness and earnings loss found from the data. That is, the jobless duration as the independent variable in the earnings loss models reflects a pushing force; the longer the jobless duration, the more pressure the workers have to accept the wages lower than their previous ones. This alternative interpretation better reflects the reality of the hardship that most of the displaced manufacturing workers experienced during a period that saw large numbers of relatively high-paying manufacturing jobs lost for good and more lower-paying service jobs were created than ever before. In short, like the other hypotheses from human capital perspective, the conceptual problem with reservation wage and negative selectivity hypotheses are its overemphasis on the factors of the labor supply side. Its underlying assumption is that as long as the workers want to, they are able to maintain their wage level regardless of the labor conditions. It was particularly false in the 1980s—an era of dramatic changes in the labor market structure accompanied by the increasingly unbalanced power shift between capital and labor (Bluestone and Harrison 1982; Harrison and Bluestone 1988).

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The results from the tenure variable support the findings from previous research (Podgursky and Swaim 1987a; 1987b; Howland and Peterson 1988). As an indicator of job/industry specific and hard-to-transfer human capital investment, long work tenure made the displaced workers less flexible and more vulnerable in the competitive external labor market. During an era of the decline of manufacturing industries, more often than not, it represents obsolete skills. In contrast, the result from the Education variable suggests the formal educational attainment as a general human capital investment is becoming more important in the competitive external labor market, because it represents the more transferable human capital investment. Especially, it is an important indicator of trainability for the post-displacement employment. These two contrasting results again confirm the well-formed new structural argument: For the internal labor market mobility, work tenure is more important while for the external labor market mobility, general school education is more important.

The occupational and industrial change variables are good proxies of post-displacement occupational and industrial downward mobility in the context of deindustrialization. It makes more sense when we examine this assertion in the context of structural changes of American economy. For example, on the one hand, during the 1979-1983 period and 1985-1989 period, displacement from mining, construction and manufacturing occupies more than 50% and 45% of total displacement rates, respectively (Herz 1990); on the other, during almost the same period of time, three

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fourths of the increase in employment were in services and retail trade (Plunkert 1990). The CPS data during 1973-1985 demonstrates that the most exceptional growth was in the eating and drinking places and stores (Haugen 1986). These statistics suggest that the majority of displaced workers would experience downward mobility along the occupational and industrial lines. The earnings loss due to occupational/industrial changes is a labor market form of the abandoned occupation-and industry-specific investment. In other words, if they could stay in the same occupation and same industry when reemployed, their job/occupation-specific investment would be revalued, if not appreciated, instead of being abandoned as in the situation of occupational and industrial change. Under the circumstance of the economic restructuring, however, the reality for the majority of the displaced manufacturing workers is that the chance is very limited to maintain their investment by finding jobs in same occupation or same industry after being displaced.

Advanced knowledge about displacement reduced earnings loss only in the 1988 survey, which covers the best economic recovery period in the time frame of this study. We may conjecture that advanced knowledge is able to prevent earnings loss only when the economic cycle is on its up-turn; labor is in higher demand; and labor market is less competitive. Consistent with the previous findings along this research line, the advanced knowledge variable in the jobless duration seems to support the policy argument about enforcement of advance-notice law that advanced knowledge enables workers to start job search earlier, even before their jobs are

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terminated.

The result from Year Displaced confirms the 'catch-up' hypothesis from the earnings loss models, suggesting that the earlier the displacement occurred in the five-year survey period, the larger the probability of reemployment at the survey time and thus the longer 'catch-up' time the workers have in the earnings. The result--the shorter the working hours, the larger the earnings loss--implicitly reflects that being unable to find full-time employment after displacement is one of major factors that caused earnings loss. This finding is consistent with the previous literature on the difficulties the displaced workers had finding full-time employment and many workers had to run between several part-time jobs after being displaced in order to make the ends meet.

From the socio-demographic variables, the findings about the racial and sexual differentials in jobless duration and earnings loss imply the existence of discrimination against Nonwhites and females displaced workers in the post-displacement external labor market. In other words, female and minority ethnic displaced workers face a more foul labor market conditions after displacement. These findings largely support the previous research along this line.

The findings from the age variables seem to support the argument from the previous research that once work tenure is controlled, age is of little importance, although in the current study there appears no high collinearity between age and tenure variables. A comparison with the household head variable used by the previous

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study (Ruhm 1992) using the 1988 DWS data shows that the explanatory power of marital status is poor. It implies that whether or not the displaced workers are currently married is not as important as whether they are household heads. Moreover, there might be a gender and marital status/household head interactive effect. For instance, Swaim and Podgursky's (1989) analysis of the 1984 and 1986 DWS pooled data and Podgursky and Swaim's (1987b) analysis of 1984 DWS data found that both married and household head males had shorter jobless duration than married and household head females.

VIII.3. Conclusions

Overall, the current study's exploration of the CPSDWS data provides us with a good assessment of the determinants of earnings loss and duration of joblessness following displacement for the displaced manufacturing workers. The empirical results from the models developed based on the dynamic theory of labor market segmentation and deindustrialization theory confirm the main hypotheses of the present study. From these empirical findings, several conclusions can be drawn. First of all, being from the subordinate primary labor market segment is the major disadvantage on the post-displacement labor market experience. The differentiation in earnings loss for the workers from the two labor market segments suggests a trend of bipolarization in post-displacement earnings. Being from core industries which were affected more by deindustrialization appears to have a disadvantageous effect on reemployment.

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opportunities. Second, in the context of deindustrialization, migration is no solution to
the post-displacement earnings loss for the displaced manufacturing workers
regardless of workers pre-displacement labor market segment affiliation. The
speculation is that migration effect might be more areal-labor-market specific than
labor-market-segment specific. Third, what is important in post-displacement earnings
and job opportunities is not whether the displaced workers moved or not but whether
or not they could stay in the same occupation or same industry when they are
reemployed. In other words, it is a question of whether or not they can save their
previous job-specific investment. Finally, facing economic structural changes, workers
with higher level of school education were more flexible and more adaptable to the
external labor market than workers with higher level of job- and industry-specific
investment. Displaced from the internal labor market, female and ethnic minority
workers have additional disadvantages in the post-displacement external labor market.

The current study has made its intended contributions to the existing literature
on labor market segmentation and labor migration in the following terms: The
evidence negates the human capital and neo-classical hypothesis about migration
outcome and implies that migration as an individual labor market strategy following
displacement cannot overcome the effects of economic structural changes. In
comparison with the previous studies of labor market segmentation and industrial
segmentation which largely focus on internal labor market mechanisms and its social
and economic outcomes, another major contribution that the current study made is

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that the models examine post-displacement external labor market economic outcomes in the segmentation theoretical paradigm and provide us with partial answers to the question of whether the characteristics of segmentation have importance in the external labor market in the context of the economic restructuring in the U.S.

VIII.4. Policy Implications

The last but not least contribution that the current study made deserves a little more detailed discussion. That is, what policy implications can we derive from the major findings of this study? At first glance, consistent with what the previous studies suggested, the results from this study seem to imply that displaced workers suffered substantial earnings loss and experienced prolonged spell of unemployment because they lost their vocational specific investment (advantages) and become ill-adjusted and disadvantaged facing the changed demand of labor market. Therefore, it is an adjustment problem. Then the policy implication is that both federal and local governments should step in to help them adjust to the new labor market conditions emerging from the structural changes. Based on this perception of workers displacement, for more than twenty-five years the federal government as well as individual state governments have provided retraining programs to help the displaced workers go through this process of labor market adjustment. At the federal level, the first comprehensive attempt to provide adjustment assistance to displaced workers was the Manpower Development and Training Act (MDTA) passed in 1962, which was

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replaced in 1973 by the Comprehensive Employment and Training Act (CETA).
CETA was replaced in 1982 by Comprehensive Employment and Training Partnership
Act (JTPA). Title III of JTPA is specifically directed at meeting the needs of
displaced workers, which was recently amended as the "Omnibus Trade and

Under these laws, a great number of retraining programs have been designed
and implemented. Unfortunately few turned out successful in terms of expected
improvement in employment rate and earnings. A review of evaluation studies was
done by Leigh (1991) on three representative types of displaced workers assistance
programs under CETA--Job Search Assistance (JSA), Classroom Training (CT) and
On Job Training (OJT)--on different sites. He found that their cost-effectiveness
varied widely. In summary, among three of them, JSA programs were the most cost-
effective and considerably speeded up the reemployment process. OJT had a larger
overall net impact on earnings than CT but not consistently positive. CT is the least
cost-effective. The author notes that probably its effect may accrue in the long run.

While discussing the effectiveness of those programs, Leigh failed to pay
sufficient attention to the important distinction between the advantaged displaced
workers and disadvantaged displaced workers and the consequential differences in
labor market outcome. The current study made such an effort from the dynamic labor
market segmentation perspective. The major policy implication from this effort is that
the subordinate segment workers faced disadvantages in the external labor market and

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thus retraining and reemployment programs should be targeting them specifically. In other words, the reemployment and skill retraining programs should be targeted closely on the disadvantaged displaced workers who suffered most from the displacement.

Leigh's review indicates that the effects of retraining and reemployment programs varied widely across racial and sexual groups. In this respect, the results of current study on the racial and sexual differential in earnings loss and jobless duration imply that retraining and reemployment programs should be also targeting the disadvantaged racial and sex groups.

Although Leigh (1991) highly recommends the JSA type program combined with skill-specific retraining programs, beside the high cost of such efforts, he found that their overall positive effects on earnings and employment opportunities are short-lived. In the long run, the participants' wages and employment opportunities are no better than the nonparticipants. What this finding implicitly suggests is that facing the structural changes of the economy, retraining and reemployment programs, as labor supply side intervention, has very limited remedial effect on earnings loss.

The results from the current study—the reemployed manufacturing workers from the subordinate primary segment suffered more earnings loss than their counterparts from the independent primary segment; those who changed their occupations and industries when reemployed lost more earnings than those who stayed in the same occupations and industries; the majority of them had to change their

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occupations and industries, and migration did not improve their lot—all imply that when relatively high-paying jobs in the old smoke stock industries were replaced by the low-paying service jobs, retraining and adjusting workers into those lower-paying jobs are no long-term solution to earnings loss. Higher-paying jobs need to be created. That is, labor demand side should be more the place where the solution ought to be sought.

However, we have seen no ways of creating high-paying jobs at nobody's cost. In the heated debate between the laissez-faire that emphasizes efficiency of market mechanisms (Chrisman, Carroll and Gatewood 1987) and the socialistic approach that advocates a national industrial policy (Bluestone and Harrison 1982), both sides try to pinpoint the weaknesses of the other argument as a policy. It is true that neither of them is perfect. The high cost at the labor side for the laissez-faire approach and high social cost and inefficiency for the socialistic approach are both apparent. More importantly, neither of them can guarantee generation of high-paying jobs. When he recognizes that structural changes are inevitable for the American economy to maintain its advantageous status in international competition, Robert Reich (1991) has

39 Bluestone and Harrison (1982) advocate "democratic socialist reindustrialization" involving 1) Plant-closing legislation; 2) corporate and personal tax reforms; 3) an industrial policy to channel investments, adjust the transition from declining to growing industries, and deal with corporate bail-outs; and 4) strengthened social wage and safety net. Chrisman, Carroll and Gatewood (1987) argue that such a socialist approach can slow the transition from declining to growing industries, tie up capital in fields with limited potential, and inhibit improvements in our relative efficiency and competitiveness in world markets. Businesses themselves can do it better without a national industrial policy.

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a third policy approach in terms of high-paying job creation. He argues that the standard of living of American people depends less and less on the success of the nation's core corporations or on the nation's ownership of them, but increasingly more and more on what the nation contributes to the world economy. According to Reich, our contributions to the world economy demand for our skills and insights. A foreign-owned corporation that contracts with Americans to solve or identify complex problems helps Americans more than does an American-owned firm that contracts with foreigners to do the same. An implicit policy alternative on labor supply side recommended here, therefore, is improving the quality of the American work force as whole by reforming our vocational education and general education as well. Namely, a labor-supply-side measure is used as a labor-demand-side strategy. In the long run, a superior work force in the international labor market will attract the problem-solving (usually also high-paying) jobs into the U.S. This is a macro-level long-term strategic thought, which should direct other lower level policy considerations in the nation's reindustrialization. In sum, facing the structural changes in the economy, there is no single once-for-all solution from either labor demand side or supply side alone. I believe that a working policy must be comprehensive involving both long- and short-term, macro level and micro-level efforts on both demand and supply sides of a national labor market.

VIII.5. Limitations and recommendations for the future studies

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As a caveat, first of all, the fact that the migration effect on earnings loss and jobless duration did not emerge may be because the models of the current study lack controls for local economic conditions of both origin and destination of migrants, such as unemployment rate, indicators of industrial concentration and industry growth and so on. They are presumably important in determining the workers’ post-displacement mobility and its outcomes as well. It is largely probable that migration effect depends on local economic conditions. For instance, migrants from the origins with the worst economic conditions may fare much better than the stayers. Previous research in both labor economics and labor migration used various levels of local economic indicators as predictors of individual workers’ economic outcomes and found them important in determining labor market outcomes. Those nonmigration studies using CPSDWS data also incorporate unemployment rates and industrial growth rates of the respondents’ current residence (Howland 1988; Howland and Peterson 1988; Podgursky and Swaim 1987a). They found that local unemployment rate have significant positive effect on the duration of unemployment and local employment growth rates have negative effect on reemployment success. Although the Current Population Surveys record SMSA codes of the respondents’ current residence and it is possible to find data for their economic conditions, the Displaced Workers Supplements do not ask the migrant respondents’ previous SMSA codes. Future studies on this topic should make efforts in respect.

Regarding local economic conditions, furthermore, some U.S. cities had such

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high level of industrial concentration, such as automobile and steel towns; they have experienced severe plant closing/moving and downsizing in the past two decades. At the aggregate level, they are actually outliers in terms of unemployment rates and industry growth rates as well as migration rate. Thus such localities need case studies. Although there is voluminous documentation on the incidents occurring in those towns, we have known very little about people's migration behavior following displacement and its consequences, especially the long-term consequences on the workers. Thus, further longitudinal/follow-up case studies are highly desirable. In short, better knowledge about displacement and the displaced workers' post-displacement experiences will be achieved with the combination of both in-depth case studies and large scale surveys.

Moreover, the possibility of selection bias in the estimated effects of migration is common for the migration outcome studies. In other words, migrants are a selected group, different from nonmigrants in many observable as well as unobservable ways. This study is no exception. According to DaVanzo and Hosek (1981:v):

...people who choose to migrate expect to improve their lot by doing so and those who stay also believe they are doing what's best for themselves, the post-migration wages for migrants may be a biased estimate of what nonmigrants would have received had they moved; likewise, the wages of nonmigrants may not be a good indication of what migrants would have received had they not moved.

In addition, this study only focuses on differences between pre- and post-displacement earnings. But as the cliche goes, "Money isn't everything." Going back
to hometown is a common phenomenon for the laid-off workers. For instance, migrant displaced workers might lose earnings because they moved in order to gain the proximity to friends or relatives, rather than just to minimize earnings loss. The trade-off between monetary loss and gain in emotional support is obvious, let alone the hard-to-measure income transfer from staying close to the relatives and friends. In short, monetary changes should not be the only measurement of post-displacement well-being. Nonmonetary consequences of migration deserve equal attention of future migration research.

This study attempts to examine the interactive effect of migration and labor market segmentation. Although the data have sufficient information for these two variables, they lack the information on the time when the move occurred during the five-year period, distance between origin and destination, migrants’ knowledge about destination, and migrants’ information and support network. According to DaVanzo and Hosek (1981), for instance, the effect of migration on economic outcomes may not accrue immediately after migration. That is, without controlling for the time when the move occurred, we cannot determine how long after migration the effect of migration would begin to accrue if there is any effect. In addition, people move long distance with reasons. Some authors found that long-distance movers gain significantly more in wages than short-distance movers. However, the effect of physical distance can be the artifact of the variation in the migrants’ knowledge of destination, accessibility to information on destination and availability of support.

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network in destination. In short, all these factors deserve consideration when we are modeling migration consequences. With the constraints of the current data on migration-related information, our knowledge about the economic outcomes of migration of displaced workers are far from conclusive. Future studies along the research line of labor migration from the new structuralist perspective should further focus on the effects of structural constraints on individual migration outcomes (Masi 1992). In short, further empirical studies on this topic will be required before more conclusive theoretically assertions can be made.

Finally, although the data that this study explores do have the virtues of focusing on a precisely defined study group and large sample sizes as discussed previously, unfortunately like any retrospective data, the five-year DWS survey data may contain substantial measurement errors. The most common distortion of retrospective data is probably from recall errors. According to the discussion in the previous literature using the similar retrospective data to explore labor market consequences for individual workers (Alerlof and Yellen 1985; Podgursky and Swain 1987a; Horvath 1982), recall errors could have come from a combination of memory failing and either understatement or overstatement depending on individual labor market experiences and their psychological consequences. For the jobless duration, for example, the displaced workers with short spells of jobless duration tend to understate them due to little economic or psychological consequence, while those with long spells of jobless duration tend to exaggerate them because of their traumatic

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memories. Previous research has found that the one-year retrospective data on unemployment duration from both the annual Worker Experiences Supplement (WES) and the CPS consistently understates unemployment duration (Bowers 1980; Horvath 1982). Therefore, it is logical to believe that the five-year retrospective CPS Displaced Workers Supplements (CPSDWS) are likely to have substantial similar recall errors.

\footnote{Akerlof and Yellen (1985), however, also found evidence from other surveys that traumatic memories are sometime repressed.}

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# APPENDIX A

## CLASSIFICATION OF OCCUPATIONAL CODES INTO LABOR MARKET SEGMENTS

BASED ON RUMBERGER AND CARNOY’S (1980) SCHEME

<table>
<thead>
<tr>
<th>OCCUPATION</th>
<th>1980 CENSUS CODES</th>
<th>LABOR MARKET SEGMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial managers</td>
<td>7</td>
<td>Independent</td>
</tr>
<tr>
<td>Personnel and labor managers</td>
<td>8</td>
<td>Independent</td>
</tr>
<tr>
<td>Purchasing Managers</td>
<td>9</td>
<td>Independent</td>
</tr>
<tr>
<td>Managers, marketing, advertising, and public relation</td>
<td>13</td>
<td>Independent</td>
</tr>
<tr>
<td>Administrators, education and related fields</td>
<td>14</td>
<td>Independent</td>
</tr>
<tr>
<td>Managers and administrators, n.e.c.</td>
<td>19</td>
<td>Independent</td>
</tr>
<tr>
<td>Accountants and auditors</td>
<td>23</td>
<td>Independent</td>
</tr>
<tr>
<td>Other financial officers</td>
<td>25</td>
<td>Independent</td>
</tr>
<tr>
<td>Personnel, training, and labor relations specialists</td>
<td>27</td>
<td>Independent</td>
</tr>
<tr>
<td>Purchasing agents and buyers, n.e.c.</td>
<td>33</td>
<td>Independent</td>
</tr>
<tr>
<td>Construction inspectors</td>
<td>35</td>
<td>Independent</td>
</tr>
<tr>
<td>Inspectors and compliance officers, exc. construction</td>
<td>36</td>
<td>Independent</td>
</tr>
<tr>
<td>Management related occupations, n.e.c.</td>
<td>37</td>
<td>Independent</td>
</tr>
<tr>
<td>Aerospace</td>
<td>44</td>
<td>Independent</td>
</tr>
<tr>
<td>Metallurgical and materials</td>
<td>45</td>
<td>Independent</td>
</tr>
<tr>
<td>Chemical</td>
<td>48</td>
<td>Independent</td>
</tr>
<tr>
<td>Civil</td>
<td>53</td>
<td>Independent</td>
</tr>
<tr>
<td>Electrical and electronic</td>
<td>55</td>
<td>Independent</td>
</tr>
<tr>
<td>Industrial</td>
<td>56</td>
<td>Independent</td>
</tr>
<tr>
<td>Mechanical</td>
<td>57</td>
<td>Independent</td>
</tr>
<tr>
<td>Engineers, n.e.c.</td>
<td>59</td>
<td>Independent</td>
</tr>
<tr>
<td>Computer Systems Analysts and Scientists</td>
<td>64</td>
<td>Independent</td>
</tr>
<tr>
<td>Operations and Systems Researchers and Analysts</td>
<td>65</td>
<td>Independent</td>
</tr>
<tr>
<td>Chemists, except biochemists</td>
<td>73</td>
<td>Independent</td>
</tr>
<tr>
<td>Agricultural and food scientists</td>
<td>77</td>
<td>Independent</td>
</tr>
<tr>
<td>Registered nurses</td>
<td>95</td>
<td>Independent</td>
</tr>
<tr>
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<tr>
<td>Actors and directors</td>
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## APPENDIX A (Continued)

<table>
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<th>OCCUPATION</th>
<th>1980 CENSUS CODES</th>
<th>LABOR MARKET SEGMENT</th>
</tr>
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<tbody>
<tr>
<td>Painters, sculptors, craft-artists, and artists print-makers</td>
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<tr>
<td>Health Technologists and technicians</td>
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<tr>
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<td>Supervisors, financial records processing</td>
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<td>Stock and inventor clerks</td>
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<td>Expediteers</td>
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<td>Date-entry keyers</td>
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<tr>
<td>Statistical clerks</td>
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## APPENDIX A (Continued)

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<th>OCCUPATION</th>
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<td>783</td>
<td>Subordinate</td>
</tr>
<tr>
<td>Solderers and brazers</td>
<td>784</td>
<td>Subordinate</td>
</tr>
</tbody>
</table>
### APPENDIX A (Continued)

<table>
<thead>
<tr>
<th>OCCUPATION</th>
<th>1980 CENSUS CODES</th>
<th>LABOR MARKET SEGMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assemblers</td>
<td>785</td>
<td>Subordinate</td>
</tr>
<tr>
<td>Hand cutting and trimming occupations</td>
<td>786</td>
<td>Subordinate</td>
</tr>
<tr>
<td>Hand molding, casting, and forming occupations</td>
<td>787</td>
<td>Subordinate</td>
</tr>
<tr>
<td>Hand painting, coating, and decorating occupations</td>
<td>789</td>
<td>Subordinate</td>
</tr>
<tr>
<td>Miscellaneous hand working occupations</td>
<td>795</td>
<td>Subordinate</td>
</tr>
<tr>
<td>Production inspectors, checkers, and examiners</td>
<td>796</td>
<td>Subordinate</td>
</tr>
<tr>
<td>Production testers</td>
<td>797</td>
<td>Subordinate</td>
</tr>
<tr>
<td>Production samplers and weighers</td>
<td>798</td>
<td>Subordinate</td>
</tr>
<tr>
<td>Graders and sorters, exc. agricultural</td>
<td>799</td>
<td>Subordinate</td>
</tr>
<tr>
<td>Supervisors, motor vehicle operators</td>
<td>803</td>
<td>Independent</td>
</tr>
<tr>
<td>Truck drivers, heavy</td>
<td>804</td>
<td>Subordinate</td>
</tr>
<tr>
<td>Ship captains and mates, except fishing boats</td>
<td>828</td>
<td>Independent</td>
</tr>
<tr>
<td>Operating engineers</td>
<td>844</td>
<td>Subordinate</td>
</tr>
<tr>
<td>Crane and tower operators</td>
<td>849</td>
<td>Subordinate</td>
</tr>
<tr>
<td>Grader, dozer, and loading machine operators</td>
<td>855</td>
<td>Subordinate</td>
</tr>
<tr>
<td>Industrial truck and tractor equipment operators</td>
<td>856</td>
<td>Subordinate</td>
</tr>
<tr>
<td>Miscellaneous material moving equipment operators</td>
<td>859</td>
<td>Subordinate</td>
</tr>
<tr>
<td>Helpers, mechanics and repairers</td>
<td>864</td>
<td>Independent</td>
</tr>
<tr>
<td>Construction laborer</td>
<td>869</td>
<td>Subordinate</td>
</tr>
<tr>
<td>Production helpers</td>
<td>873</td>
<td>Subordinate</td>
</tr>
<tr>
<td>Stock handlers and baggers</td>
<td>877</td>
<td>Subordinate</td>
</tr>
<tr>
<td>Machine feeders and offbearers</td>
<td>878</td>
<td>Subordinate</td>
</tr>
<tr>
<td>Freight, stock, and material handlers, n.e.c.</td>
<td>883</td>
<td>Subordinate</td>
</tr>
<tr>
<td>Laborers, except construction</td>
<td>889</td>
<td>Subordinate</td>
</tr>
</tbody>
</table>
## APPENDIX B
CLASSIFICATION OF INDUSTRIAL CODES INTO INDUSTRIAL SEGMENTS
BASED ON TOLBERT ET AL.'S (1980) SCHEME

<table>
<thead>
<tr>
<th>INDUSTRY</th>
<th>1980 CENSUS CODES</th>
<th>INDUSTRIAL SEGMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MANUFACTURING-nondurable goods:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food and kindred products</td>
<td>100-122</td>
<td>Core</td>
</tr>
<tr>
<td>Tobacco manufactures</td>
<td>130</td>
<td>Core</td>
</tr>
<tr>
<td>Textile-knitting mills</td>
<td>132</td>
<td>Periphery</td>
</tr>
<tr>
<td>Textile-dyeing and finishing textiles, except wool and knit goods</td>
<td>140</td>
<td>Core</td>
</tr>
<tr>
<td>Textile-floor covering</td>
<td>141</td>
<td>Periphery</td>
</tr>
<tr>
<td>Textile-yarn, thread, and fabric mills</td>
<td>142</td>
<td>Core</td>
</tr>
<tr>
<td>Textile-miscellaneous textile mill products</td>
<td>150</td>
<td>Periphery</td>
</tr>
<tr>
<td>Apparel and other finished textile products</td>
<td>151-152</td>
<td>Periphery</td>
</tr>
<tr>
<td>Paper and allied products</td>
<td>160-162</td>
<td>Core</td>
</tr>
<tr>
<td>Printing, publishing, and allied industries</td>
<td>171-172</td>
<td>Core</td>
</tr>
<tr>
<td>Chemicals and allied products</td>
<td>180-192</td>
<td>Core</td>
</tr>
<tr>
<td>Petroleum and coal products</td>
<td>200-201</td>
<td>Core</td>
</tr>
<tr>
<td>Rubber products</td>
<td>210-211</td>
<td>Core</td>
</tr>
<tr>
<td>Miscellaneous plastics products</td>
<td>212</td>
<td>Periphery</td>
</tr>
<tr>
<td>Leather Tanning and finishing, Leather, except footwear</td>
<td>220, 222</td>
<td>Periphery</td>
</tr>
<tr>
<td>Footwear, except rubber and plastics</td>
<td>221</td>
<td>Core</td>
</tr>
<tr>
<td><strong>MANUFACTURING-durable goods:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lumber/wood products, expect furniture logging, fixtures</td>
<td>230-242</td>
<td>Periphery</td>
</tr>
<tr>
<td>Stone, clay, glass, and concrete products</td>
<td>250-262</td>
<td>Core</td>
</tr>
<tr>
<td>Primary Meta</td>
<td>270-281</td>
<td>Core</td>
</tr>
<tr>
<td>Fabricated metal products</td>
<td>282-301</td>
<td>Core</td>
</tr>
<tr>
<td>Machinery, except electrica</td>
<td>310-332</td>
<td>Core</td>
</tr>
<tr>
<td>Electrical machinery, equipment, and supplies</td>
<td>340-350</td>
<td>Core</td>
</tr>
<tr>
<td>Motor vehicles and motor vehicle equipment</td>
<td>351</td>
<td>Core</td>
</tr>
<tr>
<td>Other transportation equipment</td>
<td>352-370</td>
<td>Core</td>
</tr>
<tr>
<td>Professional and photographic equipment, and watches</td>
<td>371-382</td>
<td>Core</td>
</tr>
<tr>
<td>Toys, amusement, and sporting goods</td>
<td>390</td>
<td>Core</td>
</tr>
<tr>
<td>Miscellaneous manufacturing industries</td>
<td>391</td>
<td>Periphery</td>
</tr>
</tbody>
</table>
VITAE

Ruan Hoe was born in Shanghai, China. In 1978, he was enrolled in Anhui Normal University, China, majoring in English. He earned his B.A. in English Language and Literature in 1982 and began his teaching career as instructor at Chuzhou Teachers' College, Anhui Province, China. In 1988, Ruan Hoe was admitted to the Virginia Polytechnic Institute and State University for his M.S. in Sociology. In 1990, upon finishing his M.S. in Sociology, he began to pursue his doctorate at the VPI&SU. Ruan Hoe was granted Doctor of Philosophy in Sociology at Virginia Polytechnic Institute and State University in 1994.

Ruan Hoe