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**LABOR MARKET TRANSITIONS OF INVOLUNTARY PART-TIME WORKERS:  
HOW HARD IS IT TO GET BACK TO FULL-TIME JOBS?**

A Thesis in

Agricultural, Environmental and Regional Economics

by

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## **ABSTRACT**

In 2006, 3% of the total labor force worked part-time because they could not find enough work. The economic cost of reduced hours not only means lost income and benefits for involuntarily part-time workers, but the loss of potential goods and services for the economy as well. An analysis of involuntary part-time employment therefore is an important part of understanding the nature and magnitude of the underutilization of human resources in the U.S. economy. Yet relatively little research has been devoted to studying involuntary part-time employment and transition patterns among labor market participants in different residential areas. This study uses pooled cross-sectional March CPS data between 1996 and 2005 to identify the determinants of involuntary part-time employment and associates these variables with transitions into and out of involuntary part-time employment using matched and pooled data from the March CPS for 1996 to 2004. Results show that the probability of transitioning into full-time work remains lower than 50% highlighting the difficulty of a worker finding more hours over a one-year period. Moreover, gender and residential disadvantages exist for those who want longer hours, i.e., women are less likely to move into full-time jobs than men and workers who live in central cities and non-metro areas are less likely to find full-time jobs than their suburban counterparts.

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## CHAPTER 1

### INTRODUCTION AND OBJECTIVES

#### 1.1. Introduction

In 2006, approximately one-fifth of the U.S. labor force worked part-time, according to the Bureau of Labor Statistics (BLS).<sup>1</sup> Descriptive analyses of March Current Population Survey (March CPS) data show that on average over the last 10 years, approximately 15 percent of total part-time employment is accounted for by *involuntary* part-time employment. This corresponds to approximately 3 percent of the total labor force that worked part-time because they could not find enough work<sup>2</sup>. This group of workers is of particular interest because it is often this group that fails to receive employer-provided benefits as well as works fewer hours and earns less income in total. Involuntary part-time employment indicates an economy's inability to provide enough work hours to match workers' preferences. This study focuses on the characteristics of workers in the U.S. labor force who experience involuntary part-time employment and those factors that influence their transitions into and out of involuntary part-time employment. Of particular interest is the key question: under what conditions do involuntary part-time workers secure full-time employment?

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<sup>1</sup> According to household data annual averages, there were 117,016,000 full-time workers and 24,714,000 part-time workers employed in the United States in 2005. <ftp://ftp.bls.gov/pub/special.requests/lf/aat12.txt>. See also <ftp://ftp.bls.gov/pub/special.requests/lf/aat20.txt> for the detailed table.

<sup>2</sup> See Appendix Figures A.1 and A.2 for involuntary part-time employment over time in the U.S. as a percent of total part-time employment (Figure A.2) and as a percent of total labor force (Figure A.2).

## 1.2. Conceptual Background

Labor markets can be characterized as highly dynamic, with the needs of employers and employees varying substantially over time and space. Part-time employment is one of several different job arrangements that accommodate these varying needs. The Bureau of Labor Statistics defines part-time workers as regular wage employees who usually work between 1 to 34 hours per week. However, the concept typically goes beyond the definition based on hours. Different categories include: 1) temporary part-time versus permanent part-time, 2) seasonal part-time versus year-round part-time, 3) part-time as primary job versus part-time as secondary job, and 4) voluntary part-time versus involuntary part-time. Each classification of 'part-time employment' focuses on different groups of employees and employers, reflecting varying needs.

This study focuses on involuntary part-time employment where part-time work is defined as working 1 to 34 hours per week in a reference week for economic reasons. Unlike voluntary part-time workers who choose to work part-time due to the variable needs of the labor supply itself<sup>3</sup>, involuntary part-time employees would prefer to work full-time but only can find part-time jobs.<sup>4</sup> These

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<sup>3</sup> According to the BLS, voluntary part-time employment includes those persons who usually work part-time and were at work 1 to 34 hours during the reference week for a noneconomic reason. The group includes those who gave an economic reason for usually working 1 to 34 hours but said they do not want to work full-time or were unavailable for such work. Noneconomic reasons also include, for example: illness or other medical limitations, childcare problems or other family or personal obligations, school or training, retirement or Social Security limits on earnings, and being in a job where full-time work is less than 35 hours. (<http://www.bls.census.gov/cps/bconcept.htm>)

<sup>4</sup> According to the BLS, involuntary part-time employment refers to individuals who gave an economic reason for working 1 to 34 hours during the reference week. Economic reasons include slack work or unfavorable business conditions including material shortages and repairs to plant or equipment, start of

include transitional workers who are ready to move to full-time jobs when available as well as workers whose hours have been cut-back by their employers to adjust to changing economic conditions affecting labor demand.

### **1.3. Problem Statement and Objectives**

Although part-time jobs generally result in lower wages and fewer employer-provided benefits, a trade-off still exists for many workers between work-time flexibility and/or work-hour scheduling on the one hand and money income with employer-provided benefits. Those working part-time on a voluntary basis may include those preferring work-hour flexibility. Unlike their voluntary part-time counterparts, involuntary part-time workers cannot find full-time jobs or find that their full-time hours are cut back by their employers due to slack work conditions or decreasing demand. Despite the importance of involuntary part-time employment in the labor market, this area of inquiry is relatively understudied by residence. That is, we know relatively little about how involuntary part-time employment varies across rural and urban (or non-metro and metro) places.

This dissertation uses detailed data on socio-demographic and economic characteristics to identify the determinants of involuntary part-time employment, and associates these variables with transition into and out of involuntary part-time employment. More specifically, this dissertation explores the varying characteristics of involuntary part-time labor by residential status (i.e., central city

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termination of job during the week, inability to find full-time work, and seasonal declines in demand. Those who usually work part-time must also indicate that they want and are available to work full-time to be classified as part-time for economic reasons. (<http://www.bls.census.gov/cps/bconcept.htm>)

suburban, non-metro), and movements of involuntary part-time workers among different labor states -- focusing on the key transition between involuntary part-time and full-time work -- and investigates if these characteristics and transition dynamics differ by gender and residence. March CPS data between 1996 and 2005 are used. These data coincide with the post-PRWORA or post welfare reform period.<sup>5</sup>

The two major objectives of the research are as follows:

1. To identify socio-demographic and economic characteristics that influence the likelihood that a person will be among the involuntary part-time employed, with a specific focus on the influence of gender and residence.
2. To describe transition patterns of U.S. workers over time into and out of involuntary part-time work, and identify those factors influencing these transitions and particularly the transition from involuntary part-time work into full-time jobs.

Central cities and non-metro areas have different characteristics than each other and than suburban areas in terms of available job opportunities, characteristics of the labor force and availability of support, such as access to daycare, transportation, and other public services, along with the prevalence of poverty. Therefore, non-metro, suburban, and central city labor markets will be modeled separately to assess inter-group variations, to better target policy. To explore this possibility, under objective 1 multinomial probit models with five

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<sup>5</sup> The Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996 gives states the power to mandate work requirements for welfare recipients by placing a lifetime limit (60 months) on the number of months a welfare recipient may receive assistance.

discrete choices along with descriptive statistics are used, using March CPS data between 1996 and 2005.

The second objective of the study is to better understand transitions into involuntary part-time work and from involuntary part-time work to alternative labor states. The main focus is on transition between involuntary part-time employment and full-time employment while additional consideration is given transition between involuntary part-time employment and self-employment. Binomial and multinomial probit models are employed. Matched and stacked samples of CPS data between 1996 and 2004 are used to create pooled short-panel data sets for this purpose. Separate models are estimated for men and women.

This dissertation departs from existing involuntary part-time employment studies in several important aspects. Firstly, involuntary part-time employment is studied by taking residential differences into account unlike previous research that analyzed involuntary part-time labor markets but did not account for residential differences. Also, the transition dynamics of involuntary part-time employment is not often a subject of research and not well understood. Further, although involuntary part-time employment in different residential areas and transition probabilities are discussed in recent underemployment studies, the focus is not on involuntary part-time employment. The focus in this study is to better understand the involuntary part-time workforce in the U.S., and the ability of this workforce to secure better jobs over time at least in terms of hours if not also benefits and higher wages.

Secondly, this study estimates multinomial probit (MNP) models including time components, allowing for a more rigorous analysis of transition probabilities. Due to computational intensity, previous literature in this area of research has estimated multinomial logit models. Since multinomial probit models allow for correlated error terms across alternatives and unequal error term variances, computing each alternative is much more complex and intense. Using multinomial probit models is especially important in the involuntary part-time employment context since it does not assume independence of irrelevant alternatives.

Finally, the dissertation is organized as follows. Chapter 2 reviews the literature on part-time labor markets with an emphasis on historical evaluation of the research and special emphasis on recent literature on involuntary part-time employment. Chapter 3 is then devoted to the conceptual and theoretical framework, data, and methodology. This chapter considers the special features of the Current Population Survey to create short-panel data. A descriptive analysis is provided in chapter 4, and chapter 5 includes the model estimation results. Chapter 6 includes the summary and conclusions including discussion, policy suggestions, and limitations.



## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1. Introduction**

The role of part-time employment has received attention in the labor economics literature (Tilly 1991, 1992; Blank 1989; Fallick 1999; Levenson 1996; Nardone 1995) since the 1980s. Despite ongoing discussion of the advantages and disadvantages of part-time work, research has focused on certain aspects of part-time employment, primarily on wages for part-time versus full-time work (Blank 1990; Ehrenberg, et al. 1988; Ferber and Waldfogel 1998; King 2000; Klein, et al. 2000), and on the participation of women in the part-time labor market (Blank 1989, 1990; Long and Jones 1981; Miller 1997).

A significant amount of study is motivated by the fact that nearly one in five employees in the U.S. is employed part-time (Tilly 1992; EBRI 1994). The characteristics, nature, and determinants of part-time employment are widely explored in the literature to understand the phenomenon itself. Some studies have been descriptive in nature (EBRI 1994; Fallick 1999; Levenson 1996; Nardone 1986, 1995; Snider 1995; Sundstrom 1991; Tilly 1991; Williams 1995). Others have analyzed various relationships between part-time work and education, age, experience, gender, ethnicity, marital status, number of children, wages earned, access to benefits, health insurance availability, spouse's employment, child care availability, and income. Over time, some of these relationships have evolved or changed, parallel to the changing economy. For example, in 1976 a positive

relationship was observed between the probability of part-time female labor force participation and education, whereas by 1986, increases in education reduced the probability of part-time participation of females in favor of full-time work (Miller 1997).

The part-time labor market literature was driven by the growth of part-time employment in the 1970s and 1980s. This growth can be explained by both supply and demand approaches. Demographic changes and especially the increasing employment of women, industrial restructuring, as well as the creation of more part-time jobs by employers are responsible for most of the observed growth (EBRI 1994; Tilly 1992).

The supply-side arguments principally focus on the advantages (e.g., flexibility of the part-time labor market for those preferring to work part-time) and disadvantages (e.g., relative lack of availability of health and retirement plans to part-time workers and the receipt of lower wages) of part-time employment. In contrast, the demand-side arguments heavily focus on the cost-reducing advantage of using part-time labor from the employer's point-of-view, although some argue that the high turnover rate of part-time labor resources results in higher costs to the employer from a (continuous) need to train labor (Montgomery 1988; Pitts 1998; Tilly 1991, 1996). Other literature seeks to understand the nature of part-time employment, focusing on the differential wages received by part-time versus full-time workers.<sup>6</sup>

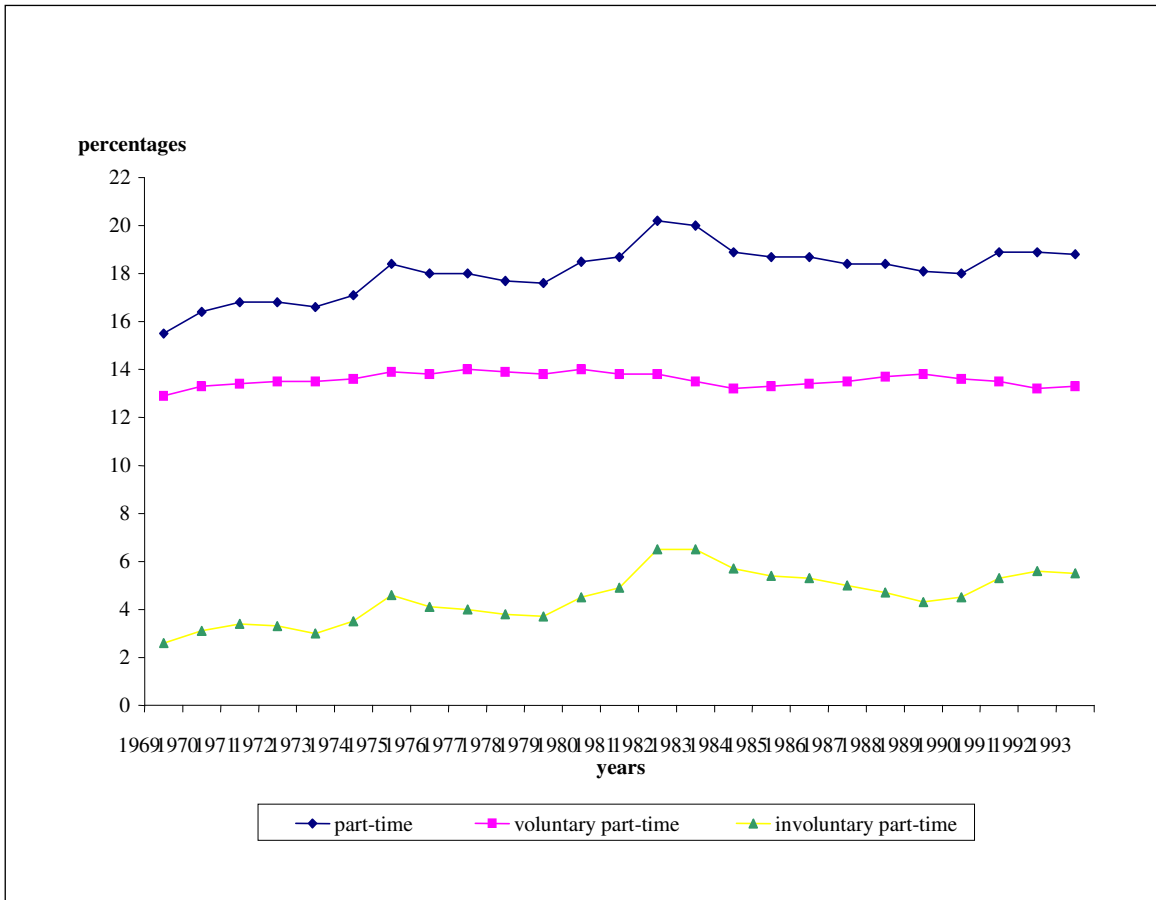
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<sup>6</sup> Related literature is reviewed in the wage structure section of this chapter.

In the 1980s, the rate of growth of part-time employment slowed but the share of involuntary part-time labor as a proportion of the part-time workforce continued to increase. The special report ‘Characteristics of the Part-time Work Force: Analyses of March 1993 Current Population Survey’ published by the Employee Benefit Research Institute (EBRI), shows that between 1969 and 1993 the average annual increase of the voluntary part-time workforce was 2.0 percent while the average annual increase of the involuntary part-time work force was 5.2 percent. The same report indicated that “as a percentage of the total workforce, the voluntary segment of part-time workforce has remained fairly constant. It is in the involuntary part-time work force that fluctuations have occurred following economic cycles... Nevertheless, even if the proportion of all workers in part-time status were to remain constant, the growth in the absolute number of part-time workers –particularly among involuntary part-time workers– draws public attention to this area.” (EBRI 1994: p. 5) Figure 2.1 was reconstructed using data from EBRI to show trends in the part-time labor force between 1969 and 1993.

The increasing relative ratio of involuntary part-time workers to voluntary part-time workers raised concern among labor economists. New concepts were introduced including ‘voluntary part-time employment’ and ‘involuntary part-time employment’; ‘short-term jobs’; ‘good jobs’ and ‘bad jobs’; ‘primary

**Figure 2.1. Part-time Labor Force Participation, 1969-1993 CPS**



Source: Reproduced using CPS part-time labor force data published at EBRI Special Report and Issue Brief: "Characteristics of the part-time work force: analysis of March 1993 Current Population Survey", May 1994.

(retention) part-time jobs ' and 'secondary part-time jobs'.<sup>7</sup> (Tilly 1991). It is mostly argued that the demand for part-time employment increased, contributing to a higher share of involuntary part-time workers. Some also argue that the effect was doubled in this period due to the decreases in the part-time labor supply that simultaneously occurred (Larson and Ong 1994). The increasing prevalence of involuntary part-time workers may represent the underutilization of the nation's labor resources.

In this chapter, literature is first reviewed in two different but overlapping dimensions: 1) labor supply versus labor demand as related to part-time employment, and 2) voluntary part-time work versus involuntary part-time work, with complementary but separate sections on wages, industry and spatial aspects of the part-time labor market. A third important dimension is also considered under spatial aspects, i.e., the influence of metro versus non-metro residence.

## **2.2. Part-time Work: Supply vs. Demand**

Analysis of the driving forces behind the increasing prevalence of part-time employment observed in recent decades encourages discussion on whether it is a supply-side or demand-side phenomenon (or both). Research makes a distinction between these two sides, considering different aspects of flexibility for both employee and employer. Industrial and structural changes in the economy

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<sup>7</sup> Tilly (1992) defined short-term employment, good jobs, bad jobs and primary and secondary markets to explore why, where, and how part-time employment is used as follows: Short-term employment: instead of laying workers off during a business downturn, an employer temporarily reduces workers' hours. Secondary part-time jobs: are characterized by low-skill requirements, low pay and fringe benefits, low productivity and high turnover. Retention part-time jobs: good part-time jobs created to retain valued employees whose life circumstances prevent them from working full-time, particularly women with young children.

are also considered. On the supply-side of the economy, arguments generally focus on voluntary part-time employment; on the demand-side, economic conditions such as tight labor markets<sup>8</sup>, economic downturns, and high unemployment rates force workers to accept part-time work rather than leaving the labor force altogether or becoming unemployed.

### **2.2.1. Supply-side Approach**

People choose to work part-time for different reasons. Many find that part-time employment accommodates their needs for balancing job and family responsibilities better than full-time employment (Blank 1989,1990; Miller 1997; Lester 1996). Trade-offs between time and wages/benefits are made by those who have other work responsibilities (Blank 1990; Ferber 1998; King 2000; Klein, et al. 2000). These decisions are made despite labor market inequalities including average lower wages for part-time employees than their full-time counterparts,<sup>9</sup> although the gap varies by occupation. Benefits are less likely to be provided by employers to part-time workers, as compared to those in the full-time workforce. Benefits are rarely provided by so-called ‘bad jobs’.<sup>10</sup> However, it could be argued that health insurance coverage through a full-time employed spouse has an important effect on the individual’s part-time work decision, since many of part-

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<sup>8</sup> Tight labor markets would cause increasing wages, improve working conditions to retain skilled workers, and lead employers to provide training for unskilled workers. In turn, these incentives attract more workers into the labor markets such as unemployed dislocated workers, welfare recipients and many young workers.

<sup>9</sup> See detailed discussion in wage structure section of this chapter.

<sup>10</sup> Tilly (1991: p. 11) defines bad part-time jobs as ‘bad’ in terms of low pay, lack of advancement opportunities and high turnover rates.

time workers are covered by their full-time spouse's health insurance (Tilly 1996; Belous 1989; Buchmueller and Valletta 1999).

Research shows that men and women exhibit different characteristics when they make their choice between part-time and full-time employment. Except for highly-skilled men employed on a part-time basis, men usually do not prefer to work part-time (Wenger 2001).<sup>11</sup> Conversely, empirical evidence shows that women's choice of part-time employment is mostly voluntarily, rather than involuntarily (Caputo and Cianni 2001), and determined by household characteristics including education, ethnicity, and age (Blank 1994; Miller 1993; Nakamura and Nakamura 1983).

Due to the significant increase in part-time labor participation among women in the 1970s and 1980s, women's labor force participation behavior attracted the attention of many researchers. Studies primarily focused on two areas: 1) factors that influence women's decisions to participate in part-time work, and 2) labor market inequalities in terms of wages received (Blank 1989; Long and Jones 1981; Main 1988) and characteristics of women's employment (Blank 1989; Long and Jones 1981; Main and Elias 1987; Miller 1997; Perry 1990). Two important results are commonly found: 1) women are more likely than men to be employed part-time and are often discriminated against as full-time workers, including being paid lower wages than their full-time counterparts (Blank 1989, 1994). They also are more likely to receive lower fringe benefits (Wenger 2001),

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<sup>11</sup> According to the BLS, nearly 70% of men employed part-time would prefer regular full-time employment (Wenger, 2001).

and more likely to have secondary sector job placement in the part-time labor market (Tilly 1991),<sup>12</sup> and 2) marriage, having young children (less than 6 years old) present in the household and having larger family sizes are found to play very significant roles in the decision to pursue part-time employment (Blank 1989; Lester 1996; Lundberg 1988; Miller 1993).

Many researchers model married women's work decisions individually (rather than jointly with the spouse) even though labor decisions are found to be determined by family characteristics, including number of children and household income (Lester 1996; Lundberg 1988; Miller 1993,1997; Nakamura and Nakamura 1983). Lundberg (1988) showed that couples without preschool-age children present in the household do not jointly decide on their labor force participation, whereas couples with young children show strong interactions in work hours and negative cross-earnings effects. Relevant studies suggest opposite effects of having a child on male and female labor supply decisions. While having a child/children reduces the (formal labor market) work hours and wages of women, it significantly affects the labor market behavior of men in the opposite way. On average, a child increases the male's wage rate by 4.2% and hours by 38 hours a year (Lundberg and Rose 2002). Moreover, strong evidence of interdependence of decisions to adjust the hours of work of spouses is found for couples with one or more children under 6 years of age (Lundberg 1988).

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<sup>12</sup>Tilly (1991) defines secondary sector jobs as jobs with low-skill requirements, low pay, and low fringe benefits, low productivity, and high turnover.



### **2.2.2. Demand-side Approach**

The demand-side approach was popular in the late 1980s when discussions were oriented toward employers' needs and employers' preferences as opposed to employees' needs and preferences. According to the demand-side point of view, part-time work becomes more prevalent for a number of reasons. Reasons include cost-cutting behavior of employers such as fewer fringe benefits (Buchmueller and Valletta 1999) and less overtime pay (Williams 1995), declining influence of unions (Williams 1995), and flexibility for adjusting the labor force within a firm (Belous 1989). Further, part-time labor is an important supply source for industries such as the service and retail industries. This aspect is well-documented in the managerial and organizational theory literature (Buchmueller and Valletta 1999; Friesen 1997; Klein, et al. 2000; Lettau 1997; Lettau and Buchmueller 1999; Montgomery 1988; Montgomery and Cosgrove 1993; Pitts 1998; Snider 1995).

Earlier studies suggest that increasing part-time employment is a response to firms' search for more flexible and less costly job arrangements (Belous 1989; Harrison and Bluestone 1988; Tilly 1991). Tilly (1992) points out that 'employee benefit' cost savings are considered an important advantage to hiring low-skill part-time workers. Some of these employee benefits comprise the quasi-fixed cost of a firm, and these vary with the number of workers, not the hours<sup>13</sup> (as health insurance does). Indeed, health insurance appeared to be the only benefit

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<sup>13</sup> Quasi-fixed cost in this context is per person expenditures which are incurred regardless of the number of hours worked (Pitts 1998).

representing a true quasi-fixed cost to employers meaning that the cost per hour worked is greater for part-time employees than it is for full-time employees (Lettau and Buchmueller 1999). If the cost of insurance increases, employer expenses is also increase regardless of hours that each employee works. In this case, to compensate for the increase in other costs, the firm will replace its full-time employees with part-time employees who are less likely to be offered health insurance, unemployment insurance (Tilly 1996), and pensions (Belous 1989), and thus who do not increase quasi-fixed costs (Buchmueller and Valletta 1999). Therefore, on the demand side the cost savings from not offering employee benefits is one of the main factors affecting employer hiring decisions; however, in an ideal world, if the part-time employee does not have the personal ability to reduce the relative cost of labor (such as necessary skills, training, and capacity to handle the job), the relative cost of employing them will be higher than for full-time workers (Owen 1979). If the firm must offer benefits to part-time employees, it will not be beneficial for employers to hire part-time workers, since the quasi-fixed cost is related to the number of workers instead of hours.

Methodologically, much of the research up to 1995 examined the demand for part-time labor in a theoretical context (Ehrenberg, et al. 1988; Montgomery 1988; Montgomery and Cosgrove 1993; Owen 1979). The argument posed by these studies was that the relative cost of part-time workers compared to full-time workers determined the employer's decision on the type of employee hired. Later empirical studies (Friesen 1997; Pitts 1998) tested different hypotheses related to

this concept. Findings support the previous research. Friesen (1997) empirically showed that part-time labor is adjusted more rapidly in some industries than in some others, supporting the argument that part-time labor provides an important source of employer flexibility, at least in some industries. Pitts (1998) also supports the same argument, testing the hypothesis about the relative cost of labor. Further, empirical analyses on the demand-side have differentiated between voluntary and involuntary part-time workers in the form of wage structure. Barrett and Doiron (2001) showed using Canadian data that involuntary part-time workers have a much more disadvantaged wage structure than voluntary part-time workers. This subject is analyzed in the next section.

### **2.3. Voluntary Part-time Employment versus Involuntary Part-time Employment**

Although voluntary part-time employment accounts for much of the part-time labor force, the growth of involuntary part-time employment has recently out-paced the growth of voluntary part employment (Figure 2.1), becoming an important research problem for economists. Along with descriptive studies, conceptual and structural analyses have received attention in the economics literature.

Conceptually, the voluntary versus involuntary classifications reflect the way people make their choice between full-time and part-time employment. Involuntary part-time labor is defined as those who would prefer to work full-time but can only find part-time employment. If involuntary part-time workers are

really involuntarily, one would expect that the stay in the part-time employment state would be fairly short and transition to full-time employment status should be relatively high. This conceptualization was tested and confirmed by Stratton (1996) using probit models of employment preferences and employment opportunities applied to the March 1990 CPS. Stratton (1996) and other transition-focused studies (Blank 1989, 1994; Farber 1996; Miller 1997; Williams 1995) found that involuntary part-time labor is more likely to transfer to other labor states than any other type of employment.

Another line of research studied the differences between voluntary and involuntary part-time employment. Evidence showed that voluntary and involuntary part-time employment differs in the short run and long run by gender. Among those who are working part-time involuntarily, men constitute a greater proportion than women (Stratton 1996; Wenger 2001). This is highly consistent with the literature on why and how women and men make their decisions relative to labor force participation (full-time vs. part-time). Ferber and Waldfogel (1998) analyzed the wages and benefits of currently employed young men and women by past employment status. In a wage growth model, controlled for changes in the length of nontraditional work experience, they reported that both voluntary and involuntary part-time experience is worth less than full-time work experience for men. However, voluntary part-time work experience is worth as much as full-time work experience whereas involuntary part-time work experience does not have an impact for women in terms of wages. It is also shown that although voluntary

part-time work experience has some value for women, part-time work is associated with lower pay for both men and women (Ferber and Waldfogel, 1998). Further, Green and Ferber (2005) found with recent data that voluntary part-time work experience while in school has an increased earning affect for both men and women; however, involuntary part-time work experience has no significant impact for either gender. Moreover, it is also shown by Barrett and Doiron (2001) that involuntary part-time workers are paid poorly – i.e., have low earnings. Earnings differentials between full-time and voluntary part-time workers are found to be less than \$1<sup>14</sup>, while the differential between full-time and involuntary part-time workers is found to be more than \$2.50<sup>15</sup> per hour (Barrett and Doiron 2001) using Canadian data. Therefore, the characteristics of involuntary part-time labor and consequences of involuntary part-time employment are not very similar to those of voluntary part-time employees.

These conceptual discussions lead to another discussion on how to manage and utilize involuntary part-time workers in an economy. It is often argued that unlike voluntary part-time work, involuntary part-time work means wasted resources and an increasing cost for both the individual and society (Ong and Larson 1989; Partridge 2003). The characteristics of involuntary part-time workers are actually more similar to unemployed individuals seeking full-time work than to voluntary part-time workers (Stratton 1996; Partridge 2003).

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<sup>14</sup> \$0.36 for female and \$0.92 for male

<sup>15</sup> \$2.55 for female and \$3.19 for male

Many researchers consider involuntary part-time employment as part of underemployment research. Vera-Toscano, et al. (2004) describe underemployment as a “comprehensive measure of under-utilized labor resources since underemployment often includes not only unemployment but also some types of discouraged or sub-employed workers, involuntary part-time employees and low-income workers with marginal or unstable labor market attachment” (Vera-Toscano, et al., p:1). Jensen and Slack (2003) reviewed the underemployment literature and also describe underemployment as “a more exhaustive--and hence more valid--measure of employment hardship than mere unemployment” (p. 25). Underemployment research has documented differences between metro and non-metro underemployed labor resources and the barriers that non-metro underemployed workers face (Findeis and Jensen 1998; Jensen, et al. 1999).

Some studies search to explain why there is now a higher share of involuntary part-time employment in the part-time labor force (Tilly 1992; Larson and Ong 1994). Researchers debate the linkages between an increasing involuntary part-time labor force in the U.S. and a high unemployment rate, growing service sector employment, declines in school enrollments, and reduced unemployment insurance coverage (Larson and Ong 1994; Partridge 2003). Others argue that involuntary part-time employment is a hidden form of unemployment (Barrett and Doiron 2001; Larson and Ong 1994; Stratton 1996) or underemployment (Kahn and Lang 1995, 1996; Lang and Kahn 1997; Doiron

2000; Landers, Rebitzer, and Taylor 1996). Empirical analysis supports a strong relationship between unemployment and involuntary part-time employment (Ong and Larson 1989). In the short-run especially, unemployment is found to be associated with a rise in involuntary part-time work (Ratti 1991).

On the other hand, a distinction between high-skilled and low-skilled part-time labor is made as part of the discussion. Again, high-skilled part-time labor is seen as a labor supply choice or form of voluntary part-time employment, whereas low-skilled jobs are mostly involuntary and demand driven (Blank 1989; King 2000; Klein, et al. 2000) Blank (1989) showed that part-time employed women earn lower wages than full-time female workers in most occupations but higher wages than full-time workers in managerial and professional occupations. These higher-wage part-time jobs are located in primary markets and are designed by employers to retain or attract valued workers who prefer to work part-time (Tilly 1992). King (2000) analyzed National Compensation Survey data from the BLS and drew the similar conclusion that some jobs exist that pay higher part-time hourly wages than full-time jobs in the same field. In his special case, these were health-related jobs and mostly of the voluntary part-time type. Another study (Klein, et al. 2000) also showed the same phenomenon from the management perspective. Findings of this study suggest that there is an increasing voluntary shift from full-time to part-time jobs among attorneys in the U.S.

A significant number of studies emphasize that the growth in part-time employment observed in the U.S. is mainly due to expansion of industries that

typically prefer to employ part-time labor because the relative cost of labor is higher in these industries (Pitts 1998). Fallick (1999) documented the positive association between the growth rate of an industry and the proportion of its workforce working part-time for the period between the early 1980s and early 1990s. The expansion of the service sectors is believed to be the main reason behind much of the growth of part-time employment observed in the 1970s and 1980s (Fallick 1999; Nardone 1995; Ribar 2000). By the end of the 1980s, the largest concentration of part-time employment (71%) was in the trade industries, especially retail trade (33%), and in professional and other service (41%) industries (Kosters 1995). However, as another notable distinction between voluntary and involuntary part-time work, Fallick (1999) found no evidence for an association between involuntary part-time labor and the fast-growing industries in the U.S.

Men and women employed part-time also follow different employment patterns than their full-time counterparts in different industries. Half of those employed part-time are women who worked in ten<sup>16</sup> out of a possible 236 industries, whereas only one-third of all full-time employed women worked in the same industries (Wenger 2001). These findings are supported by studies of wages and occupational segregation of women and men (Blank 1989, 1990; Wenger 2001).

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<sup>16</sup> The top ten industries are: eating and drinking places, elementary and secondary schools, hospitals, department stores, grocery stores, colleges and universities, private household services, health services, nursing and personal care, and child care.



## 2.4. Labor Market Transitions

Transitions into and out of the part-time labor force constitute another important research area. Researchers (e.g., Blank 1989, 1994; Farber 1996; Miller 1997; Stratton 1996; Williams 1995) have examined the relationships between changing labor market conditions and labor supply behavior that affects labor transitions. Two important questions arise: 1) is part-time employment really a temporary stage in making a transition to a full-time job<sup>17</sup>, and 2) what factors limit the transition to full-time employment?

Blank (1989) analyzed the dynamics of women's labor force participation using the Panel Study of Income Dynamics (PSID) from 1976 to 1984 and found evidence of a greater probability of transition from part-time to full-time jobs than for any other labor force status,<sup>18</sup> although she was not able to document any particular pattern in the use of part-time work as a bridge to full-time jobs among women. However, Miller (1993) found that women who work part-time have a greater probability of continuing to work part-time. Women who always work part-time develop a pattern of investment in human capital that differentially encourages part-time employment (Miller 1993; Green and Ferber 2005) while women who sometimes work part-time also have a greater probability of continuing to work part-time but lack of access to training opportunities do not encourage full-time employment (Miller 1993). Ending marriage for women

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<sup>17</sup> Transition to a full-time job refers both change in job and a part-time hours becoming full-time hours. Hours per week is the criteria to determine whether a job is full-time or part-time.

<sup>18</sup> Blank (1989) found that 3 out of 4 adult women have a strong attachment to their current labor market status.

(Blank 1989), past education and work experience, and past full-time labor market status (Blank 1989, 1994; Miller 1993, 1997) are found to be the most important factors affecting transitions from part-time to full-time employment status.

Stratton (1996) also calculated transitions between part-time and full-time status for men and women, using the March 1990-91 CPS. She found that 50% of part-time workers classified as voluntary part-time workers in 1990 were employed full-time one year later in 1991. Among all voluntary and involuntary part-time workers, men were found to be more likely to change status from part-time to full-time.

Consistently, Williams (1995) studied transition probabilities between part-time and full-time work for men and women using the unpublished “Gross Change Tables”<sup>19</sup> (Table 4) from the BLS (tables are calculated from the CPS) over the period 1983 through 1989. He found that men are more likely than women to make transitions from part-time to full-time work and also from unemployment to full-time work (Williams, 1995). This result supports the observation that many males employed on a part-time basis are involuntarily part-time workers and are in the process of looking for full-time hours. Wenger (2001) stated that 70% of men employed part-time would prefer full-time jobs.

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<sup>19</sup> These are unpublished tables from BLS that are calculated using CPS data. Williams (1995) used Table 4. Table 4 differentiates full-time, part-time voluntarily, part-time for economic reasons, unemployed and individuals not in the labor force.

Some researchers have hypothesized that involuntary part-time employment has different characteristics and determinants than voluntary part-time employment and analyzed the two forms separately. As mentioned previously, many of these studies consider involuntary part-time employment a form of underemployment. A recent study by Vera-Toscano, et al. (2004) examined the short-term employment transitions of adequately employed and underemployed Canadian workers.<sup>20</sup> Using data from the Canadian Survey of Labor and Income Dynamics (SLID) for the period 1993-1996, they showed that transitions into and out of underemployment are significantly different in non-metro and metro<sup>21</sup> areas of Canada. Although non-metro adequately-employed workers are more likely to enter underemployment, they are also more likely to return to their adequate employment state than their urban counterparts. However, non-metro women are less likely to enter adequate employment than their male and metro counterparts. An earlier study by Jensen et al. (1999) also analyzed underemployment transitions using CPS data for U.S. metro and non-metro areas. Their results are similar to the Vera-Toscano, et al. (2004) study in that adequately-employed non-metro workers are more likely to enter underemployment than metro workers. However, unlike Vera-Toscano, et al.

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<sup>20</sup> The term 'adequately employed' refers to workers who are not underemployed.

<sup>21</sup> Metro/non-metro and rural/urban have been used interchangeably throughout the study. The data section describes the rural-urban as follows:

Urban is composed of census metropolitan areas and agglomerations (CMA/CA) containing large urban areas, together with adjacent urban and rural areas that have high degree of economic and social integration with that urban area. The rural and small town sample is composed of non-CMA and non-CA areas.

(2004), Jensen, et al. (1999) found that these workers are less likely to return to adequate employment. They also report similar results related to gender and place: non-metro women are less likely to become adequately employed.

## **2.5. Wage Structure**

The wage structure of the part-time labor force and the differential between part-time and full-time wages have been well-analyzed over at least the past decade (Blank 1990; Ehrenberg, et al. 1988; Ferber 1998; Hotchkiss 1991; King 2000; Klein, et al. 2000; Lettau 1997; Long and Jones 1981; Owen 1979; Tilly 1992). The consensus of the earlier literature is that part-time workers earn about 10% (Lettau 1997) to 20 % (Blank 1990) less than their full-time counterparts and receive fewer benefits, according to simple comparisons of average wages (Kosters 1995). Wage differentials will appear either if there is identical wage determination but characteristically distinct groups of workers in the two sub-sectors; or it will result from identical workers being treated differently in the two sectors (Hotchkiss 1991). Almost all earlier literature on wage comparisons assumes identical wage determination for different worker groups (full-time vs. part-time). Although a negative differential is typically observed between full-time and part-time jobs, this is not necessarily valid for all types of part-time jobs. The exception to lower earnings and lack of employee benefits can be found in newly-emerging primary sector positions,<sup>22</sup> with high wages and benefits for highly-skilled well-educated voluntary part-time workers

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<sup>22</sup> Primary positions are viewed as being permanent workers with career potential rather than as temporary arrangements (Tilly 1992).

(Klein et al. 2000; Tilly 1992). Also, industries with higher average wages and a substantial number of workers receiving benefits are those with greater negative compensation differentials between part-time and full-time employees (Pitts 1998).

Kosters (1995) studied wage differentials between full-time and part-time men and women in different industrial sectors, adjusting for differences in employers' characteristics, and points out that wages are very similar across the industrial sectors despite the current literature. He further suggests that if employers' characteristics are adjusted, more reasonable measures would be obtained. Blank (1989) also showed that women employed on a part-time basis earn more than equivalent full-time women, after controlling for selection into the labor market and part-time work. Later, King (2000) used data from the 1997 National Compensation Survey to provide more evidence and found that nationally, on average, full-time workers earned \$15.77 per hour versus part-time workers who earn \$8.89 per hour. However, when he examined different industries and occupations, he observed different patterns. Although for many occupations wage differentials favor full-time workers, in some occupations (especially health-related jobs) the differential is reversed. This is highly consistent with the previous literature that distinguishes between 'good' and 'bad' part-time jobs.

## **2.6. Aspects of Part-time Employment Related to Place**

Although there is a growing literature on the spatial aspects of labor markets, there are significant restrictions to the kinds of analysis that can be considered due to data availability. Publicly available comprehensive labor market data sets<sup>23</sup> generally do not include specific local codes for smaller units due to disclosure reasons. Therefore, many studies use regional and state-level variables to determine geographical locations in the analysis. However, it is very difficult to capture local economic conditions (specific to geographic units) that have significant effects on job markets in these areas. Ribar (2000) mapped the variability in employment within states and MSAs (Metropolitan Statistical Areas) showing that even adjacent counties within the same MSA varied significantly. For example, Washtenaw and Wayne counties in Michigan are adjacent counties but one in the top and the other in the bottom quartiles of the employment distribution. This is even more important when it comes to policy analysis and offering solutions to labor markets.

A growing literature focusing on local labor markets has compared MSAs (Bound and Holzer 1993; Freeman and Rodgers 1999), states (Topel 1986), or regions (Card and Lemieux 1997), or the nation as a whole (Katz and Murphy 1992). Although few part-time labor market studies incorporate regional

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<sup>23</sup> The CPS is the most comprehensive available data set to fit our analysis, especially in terms of the involuntary part-time labor sample size; however, the CPS data do not include location codes for smaller, less populated areas in the public use files. This represents an important limitation for this study.

differences, some studies (e.g., Partridge 2003) report that there is regional variation in part-time employment. The range across states for involuntary part-time employment changes from 1.9% to 4.9% and for voluntary part-time employment from 10.1 % to 19.4% (Partridge 2003). Involuntary part-time rates are higher in the Northwest and voluntary part-time rates are higher in the Northcentral states (Partridge 2003). These rates also vary between non-metro and metro areas, and within metro areas (central city and suburban), as shown in recent underemployment research (Findeis and Jensen 1998; Vera-Toscano, et al. 2004; Jensen, et al. 1999; Barrett and Doiron 2001).

Studies that emphasize a non-metro labor market disadvantage focus on different aspects than discussed here. For example, the employment rate of single mothers differed across rural and urban areas due to limited economic growth, fewer jobs, lower wages, lack of public transportation, and less access to child care in rural areas (McKernan, et al. 2000).

In another study, King (2000) disaggregated part-time workers' earnings by metro/non-metro categories. "One of the similarities between metropolitan and non-metropolitan areas is in the ratio of part-time workers' average weekly hours to those of their full-time counterparts. The percentages were virtually identical, 53 percent and 52 percent."(King 2000, p.28) In contrast, part-time non-metro workers earn more as a percentage of their full-time counterparts' average hourly earnings, than did part-time metro workers (King 2000).

Involuntary part-time employment has been examined in the underemployment context and sometimes found to be similar to unemployment. A study by Leppel and Clain (1993) specifically examined the determinants of voluntary and involuntary part-time employment and used multinomial logit models with a single year (1988) of CPS data. This study reported that the voluntary and involuntary part-time labor states differ in terms of reasons and determinants of each state, and vary with gender and age. Relocation to urban areas are found to have significant effect on reducing both voluntary and involuntary part-time employment of women (Leppel and Clain 1993).

Finally, involuntary part-time employment in rural areas has attracted attention as part of underemployment research (Findeis and Jensen 1998; Jensen, et al. 1999; Lichter 1987). Findeis and Jensen (1998) documented prevalence of underemployment in metro and non-metro areas from 1968 to 1993 using matched CPS files. Although involuntary part-time employment is among the smallest of the underemployment categories<sup>24</sup>, its rate remains higher in non-metro areas than in metro areas over more than 20 years. Moreover, they found that non-metro involuntary part-time workers are 80% less likely to find full-time jobs in 1993 than 1968. Involuntary part-time workers in non-metro areas encounter more severe barriers than metro part-time workers (Findeis 1993; Jensen, et al. 1999), small settlement and density patterns, lower welfare and

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<sup>24</sup> Discouraged workers represent the smallest percentage.



government support (Lichter and Jensen 2000), and lack of child care support (Weber, Duncan and Whitener 2001).

## **CHAPTER 3**

### **THEORY AND METHODOLOGY**

#### **3.1 Theoretical Model**

The decision to work part-time, voluntarily or involuntarily, can be examined in the context of the household allocation of time theoretical framework. In this context, the choice of labor market status of a household member not only reflects the individual's trade-offs between leisure consumption and goods consumption (which is a function of work time), but also reflects other household parameters such as spouse-specific resources and non-labor (exogenous) income. Therefore, departing from existing literature that often uses an individual utility maximization theoretical framework, this dissertation employs the household utility maximization framework in which the employment choices made are subject to constraints of household income, household production function and time endowment.

In a simple unitary household model (or Becker model), the household derives utility from commodities that are produced by combining market inputs and the non-market time of household members. In other words, as Killingsworth (1983) states, household members not only consume commodities but also produce them using inputs – his/her own time and market goods and services via household production functions. In this basic model, household members

maximize the total utility of the household subject to the household income and total time endowment as follows:

$$\text{Max } U = U(C_h, T_h; H_h, Z_h) \quad (1)$$

subject to

$$T = T_s + T_m + T_h \text{ (household time constraint)} \quad (2)$$

$$P_h C_h = P_s C_s - W_s X_s + W_m T_m + V \text{ (household income constraint)} \quad (3)$$

where:

$U$  = joint household utility function, which is a function of the quantity of goods and services consumed by the household ( $C_h$ ) and total leisure of household members ( $T_h$ ), given the human capital of household members ( $H_h$ ) and other household and location-related characteristics ( $Z_h$ ).

$T$  = total time endowment of household

$T_s$  = total self-employment hours

$T_m$  = total market work time of household

$P_s C_s - W_s X_s$  = net self-employment income

$P_h$  = price of consumption goods and services

$W_m$  = market wage

$V$  = exogenous income<sup>25</sup>

The utility function in the model reflects the concept of the household as a decision-making unit. The decision problem facing the household is to simultaneously choose the quantity of consumption goods to purchase, and the

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<sup>25</sup> Exogenous income includes nonlabor income such as interest, dividends, rent.

hours of husband's and wife's salaried work and self-employment to maximize household welfare. Assuming both husband and wife have optimal positive total hours of work and leisure, the first-order conditions that must be met for optimal time allocation among household members using the Kuhn –Tucker theorem are:

$$\lambda[P_s F_{x_s} - W_s] = 0 \quad (4)$$

$$\lambda P_s F_{T_s} - \gamma = 0 \quad (5)$$

$$\lambda W_m - \gamma \leq 0, T_m \geq 0, T_m (\lambda W_m - \gamma) = 0 \quad (6)$$

$$U_{T_h} - \gamma = 0 \quad (7)$$

$$U_{C_h} - \lambda P_h = 0 \quad (8)$$

$$T - T_s - T_m - T_h = 0 \quad (9)$$

$$P_s F(T_s, X_s; H_s, Z_s) - W_s X_s + W_m' T_m + V - P_h C_h = 0$$

(10)

where  $\lambda$  and  $\gamma$  are Lagrange multipliers for marginal utility of income and human time and  $P_s F(T_s, X_s; H_s, Z_s)$  is the production function for self-employment.

The basic model can be extended and modified to study different types of problems such as labor supply decisions of household members. In a such model, each household member makes choices between work and leisure among alternative labor states. This implies a trade-off between leisure and work time. In a single household, the labor participation decision (i.e., whether to participate in work or not) depends on the individual's reservation wage. If the reservation wage exceeds the offered wage in the market, the individual will choose not to

work. Alternatively, if the offered wage exceeds the reservation wage, the decision to work is made.

Exactly how much time the individual *prefers* to allocate to the labor market then depends on the individual's indifference curves between consumption goods and leisure (Figure 3.1). This implies – in the theoretical sense – that individuals are able to work as many hours as preferred at the offered wage. Figure 3.1 is the graphical representation of the individual's time allocation for two possible labor market outcomes. The horizontal axis represents the amount of time the individual allocates between work and leisure. The vertical axis represents the value of consumption goods and services. The choice of hours depends on individual preferences reflected in the reservation wage: an individual can choose work (W) or not to work ( $W_0$ ). When the choice to work is made at W, the time allocated to work is  $T_2 - T_1$  and the time allocated for leisure is  $T_1$ . The curves  $U_0$  and  $U_1$  are the indifference curves of an individual representing individual's preferences for different choices of consumption of goods and services and leisure. Wages and salaries from the work provide income to spend on consumption goods. Thus, more hours to work generate more income to spend. However most people also receive some income not related with current work activities such as interest, dividends, rent, cash gifts, etc. That type of income is called non-labor income and represented at point  $Y_e$  on the vertical axes. At that point, even if the individual chooses not to work, non-labor income ( $Y_e$ ) provides enough money to purchase goods and services.

Figure 3.1. Potential 'Work' 'Not Work' Choices

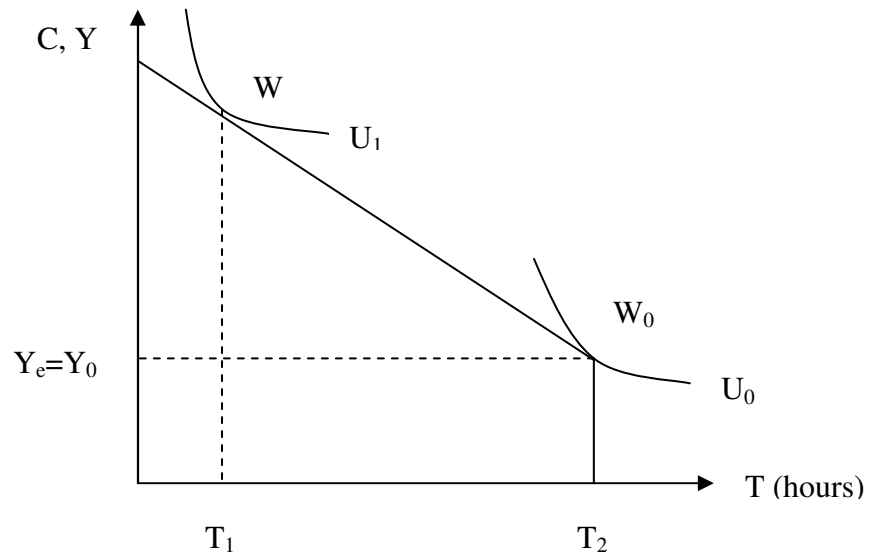
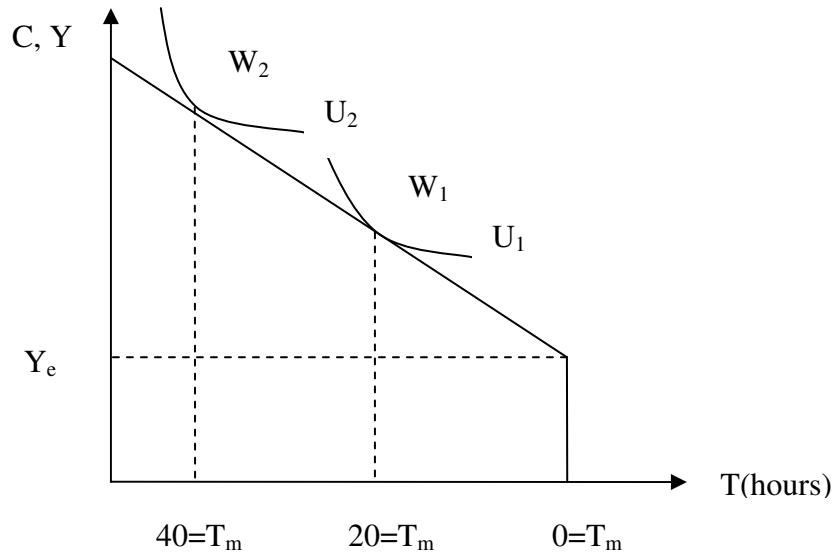


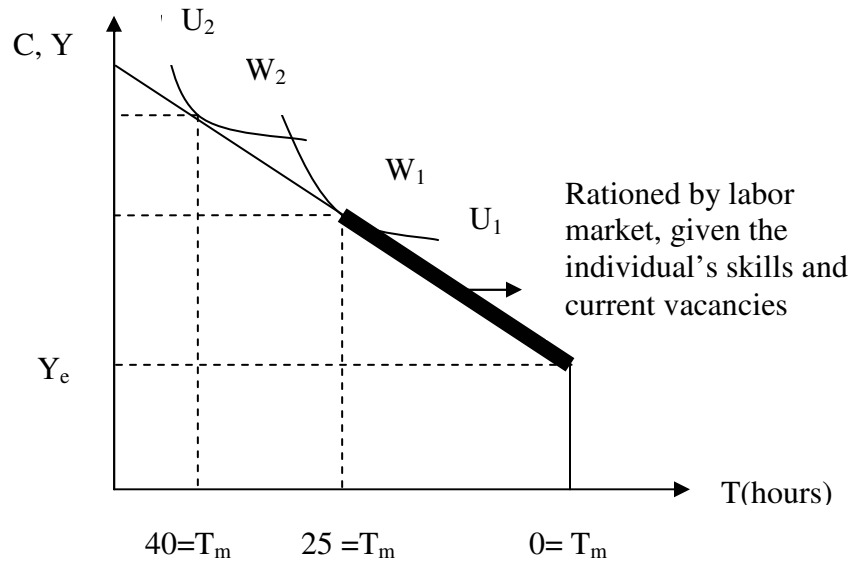
Figure 3.2 illustrates the full-time and voluntary part-time work choices of an individual constrained by continuous budget line reflecting a wage work scenario (no self-employment). When there are no discontinuities (no rationing) individuals may choose to work 40 hours a week at  $W_2$  and be on the  $U_2$  indifference curve or may choose to work 20 hours a week at  $W_1$  and be on the  $U_1$  indifference curve. However, in the real world, and as pointed out by Killingsworth (1983) and illustrated in figure 3.3, there can be discontinuities in the budget line due to ‘rationing’ that occurs within labor markets. That is, it is possible that the jobs that are offered to a household member at a particular wage (and potentially influenced by the worker’s skill set, and other characteristics) offer a *specified* number of hours (e.g., a 40-hour work week) or are rationed such that only a range of hours are offered. This is the situation that involuntary part-time workers face – where the types of jobs open to them (i.e., the numbers of hours offered) further constrain their ‘constrained utility maximization’. The difference then between *voluntary* part-time workers and *involuntary* part-time workers in a theoretical sense is that voluntary part-time workers are able to work their preferred number of hours given the options they face in the labor market whereas involuntary part-time employees face a labor market that further limits their utility maximization.

Taken more broadly, this framework can be applied to a household that has  $m$  members and purchases  $n$  number of goods. In this setting, the household members choose to become employed among many labor market alternatives or

**Figure 3.2. Full-time and Voluntary Part-time Work Choices**



**Figure 3.3 Involuntary Part-time Work Choice**





labor states subject to household income and time endowment. When household members make the decision to maximize their utility, conditional on the household income constraint, their choice can be simply categorized into four labor states: 1) not working, 2) working full-time (wage or salary work), 3) working part-time (wage or salary work), 4) self-employment, or any combination of self-employment and wage or salary work. In that case, the household preferences matter – but it is also clear that the employers’ job offer will affect the ‘labor state’ outcome. That is the rationing imposed by labor market. Once labor supply rationing is introduced in the model, analysis of the determinants of labor force participation becomes more complicated. The time that different individuals in a household allocate to different forms of work may vary, due to differences in labor productivities and wage among household members. However, if labor supply of a household member is rationed, the labor supply of other unrationed household members and total consumption of the household will be affected since household members are assumed to maximize the joint utility of the household subject to time endowment and household income. As an extension, optimal division of labor within the household that is based on relative productivities of household members may also change.

In this case, the role of involuntary part-time employment as a temporary accommodation in which the current total household utility is highest among all available labor market alternatives is of interest. Using the household utility maximization framework, it is also possible to explain transitions from one labor

market state to another along with determinants of the labor participation decision. From a theoretical perspective, workers are known to move from one labor state to another when there exists an available job that provides higher utility than his/her current job.

Finally, from society's viewpoint, those who are working involuntarily part-time or who are unemployed experience labor market distress. Even though the involuntary part-time work choice yields the highest utility under job availability constraints, workers are still not working to their full capacity or potential, a problem for any economy. This problem is pointed out in underemployment studies that focus on issues of low income, low productivity and underutilization of skills, which in turn has negative effects on growth in an economy (Vera-Toscano et al., 2003). This is an issue of inefficient labor utilization and should be addressed to improve society's welfare.

### **3.2. Data and Methodology**

Empirical specification of the problem is motivated by random utility theory, which is commonly used to model choice behavior when the alternatives are discrete choices. Random utility theory assumes that the consumer is rational and that he/she can compare alternatives based on his/her preferences. The representation of discrete choices through random utility model and interpretation of utility maximization allow a general representation of household preferences. More precisely, if household  $i$  can choose one among  $j$  alternatives it is assumed

that household  $i$  selects the alternative that provides him/her with the highest expected utility. The utility household  $i$  derives from alternatives  $j$  ( $=1, \dots, j$ ) is given by

$$U_{ij} = EU(X_{ij}, Z_i; \theta_j) + \varepsilon_{ij} \quad (11)$$

where  $EU$  represents the expected utility of alternative  $j$  and is conditional on vector  $\theta_j$  of preference parameters. It depends on a vector  $Z_i$  of socio-demographic characteristics, accounting for observed heterogeneity across households, and a vector  $X_{ij}$  of variables which are specific to alternative  $j$  and to household  $i$ . The actual utility derived from alternative  $j$  for household  $i$ ,  $U_{ij}$  also includes error term that is assumed to be identically and independently distributed across alternatives and agents. The set of parameters (model coefficients) estimated using the maximum likelihood method are based on revealed preferences and represent the common household preferences across alternatives. This framework is applied to describe the choice of labor states of an individual (which may depend on the choices of others in the household, particularly a spouse). Thus the set of alternatives ( $j=1, \dots, j$ ) now corresponds to  $j$  alternative labor states.

To fulfill the objectives of the dissertation research, multinomial probit models and binomial probit models are estimated. The first set of models analyzes the characteristics of individuals, their households, and economic conditions that influence their likelihood of voluntary or involuntary part-time work in different

residential areas (central city, suburban and non-metro labor markets), with the results being compared. The second set of models describes the labor force transition patterns of those who prefer to work full-time but are unable to find full-time jobs, and analyzes the possible effects of individual and household demographic and economic factors that influence (positively or negatively) transitions into and out of involuntary part-time labor status. Current Population Survey samples in conjunction with other data sources are used in both analyses.

### **3.2.1. The March CPS: Advantages and Limitations**

The March Current Population Survey (CPS) Annual Demographic Files for years 1996 through 2005 are used in conjunction with data from the Bureau of Labor Statistics and the Conference Board to estimate all models. The CPS is a monthly survey of about 50,000 households that has been conducted jointly by the Bureau of the Census and the Bureau of Labor Statistics for more than 50 years. A unique feature of the CPS is that sampled households from 50 states and the District of Colombia are included in the survey for 4 consecutive months, are dropped for 8 months, and then return for another 4 months before leaving the survey sample. To provide a continuum of the population every month, new rotation groups are added to the survey monthly. That feature allows construction of ‘short panel’ (longitudinal) data sets spanning a 12-month period using the rotations of the CPS. Researchers have previously used this feature of the CPS to create short panel data sets of individuals, families and/or households using different matching algorithms. Although the CPS has many advantages over

similar data sets (e.g., larger samples) and detailed labor market information, there are also limitations related to use of the CPS. Basic shortcomings of the data sets for this study are 1) unavailability of geographic codes for smaller residential areas in the public use data (that results in omitting local labor market conditions), 2) matching errors due to ‘movers’ (sample attrition), and 3) a 12-month limit to the longitudinal data from the March CPS.

The main purpose of the CPS is to provide information on labor force characteristics in the U.S. by classifying the sample population into three basic labor states: employed, unemployed and not in the labor force. Questions are asked of a sample of households to clarify the labor market status of household members. It is the primary source of information on economic statistics and provides a wide range of data coverage on issues related to the labor force characteristics of the U.S. population. The questionnaire is conducted during the calendar week that includes the 19<sup>th</sup> day of that month and the ‘last week’<sup>26</sup> questions refer to the week including the 12<sup>th</sup> of the month. Individuals who are 15 years or older<sup>27</sup> and not in the armed forces are eligible to be included at the individual level in the CPS.

Along with being a nationally representative survey, the CPS also has important features to consider for this study. Firstly, the information collected is

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<sup>26</sup> The CPS labor force questions ask about labor market activities for 1 week each month. This week is referred to as the ‘reference week’. The reference week is defined as a 7 day period, Sunday through Saturday that includes the 12<sup>th</sup> of the month. Although there are last year questions in the March CPS, detailed economic and labor status questions are asked for the reference week.

<sup>27</sup> However, published data focus on those aged 16 and over  
<http://www.bls.census.gov/cps/overmain.htm>

diverse, including regularly-collected information on labor force participation, unemployment and hours worked as well as irregularly collected information on job tenure, immigration and smoking, as examples. Secondly, CPS sample sizes are large enough to make reliable statistical inferences as well as small enough to be tractable (Madrian and Lefreng 1999).

One of the greatest advantages of the CPS is the ability to derive quasi-longitudinal samples of individuals. Although the CPS is not specifically designed to provide panel data, there is a longitudinal component that makes it possible to construct short-panel data sets through matching individual-level data across two years. Matching of individuals across years might reduce the sample size (Madrian and Lefreng 1999). But the only real drawback is the loss of information on involuntary part-time workers who move. The CPS does not track the movers. Although such panels have unique advantages in labor market studies, not following movers may lead to bias in longitudinal estimates using matched CPS files (Neumark and Kawaguchi 2001). However, the advantages for analyzing part-time labor markets with short panels developed from the CPS will outweigh the disadvantages from attrition bias (Neumark and Kawaguchi 2001). Moreover, Peracchi and Welch (1995) examine the attrition bias with labor transitions of men and women and conclude that “although selecting the matched individuals does bias measures of participation, especially for men, no systematic bias appears in the estimates of transitions after controlling for sex, age and labor force status at the time of the first survey” (p. 173). But it should be taken into

consideration that there is always a risk of attrition bias and “there is a possibility that attrition bias leads the longitudinal estimates to be understated” (Neumark and Kawaguchi 2001, p. 1).

Starting in January 1985, changes in the race and ethnicity-related question allow explicit consideration (and calculation) of the Hispanic population. A separate question was added to determine the Hispanic population in addition to the traditional question asking if a person is black, white or from other racial category. This gives the advantage of further categorization of white Hispanic and black Hispanic individuals.

Another disadvantage of the data is the limited available information about relatively small geographical areas. The CPS sample design is based on very small geographical units, thus information is collected from less populated areas too. However, due to confidentiality issues and for disclosure reasons, geographic codes are not publicly available for local labor markets. Thus it is not possible to append local data (from other data sources) to the CPS publicly available data at this time<sup>28</sup>. The lack of ability to link individual-level observations to measures of *local* labor market conditions and be able to define “rural” areas accurately is a significant limitation of the CPS data for understanding local variations in labor demand conditions.

Comparability of part-time labor market analyses before and after 1994 is another limitation that should be highlighted. Many existing studies use the CPS

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<sup>28</sup> However, Census Bureau is working to make this information publicly available in near future.

to assess part-time labor markets only until 1993; in 1994 the CPS was redesigned to capture more information about labor markets. However, redesign of the CPS also made difficult and some cases impossible comparisons to analyses conducted before 1994. Before 1994, part-time workers who exceeded 35 hours of work per week (in total) were reported as full-time workers. Such workers were classified as either full-time or part-time based on their *total* usual weekly hours (Nardone 1995). The redesign of the CPS in January 1994 made it possible to identify ‘full-time’ workers who have part-time jobs and to compare their characteristics to those of part-time workers who don’t. According to the BLS Monthly Labor Review (September 1996, pp. 43-44) “in 1995 about 6.5 million workers had part-time jobs but were classified as full-time workers because their total weekly work time at all jobs was 35 hours or more”. Among these workers, 69% work full-time in primary jobs and also have a part-time job as secondary, 14% work more than one part-time job and exceed 35 hours a week, and 17% combine two jobs to make a full-time work week. As Nardone (1995) notes, redesign of the CPS in 1994 better identifies people who are employed, provides more accurate actual and usual hours that are critical to our analysis, and allows us to distinguish between part-time jobs and full-time jobs. He also reports that redesign picks up more voluntary part-time employment and less involuntary part-time employment that results in more accurate estimation. Pre-1994 estimations are inaccurate due to the total hours definition, or more precisely they underestimate voluntary part-



time workers and over estimate the involuntary part-time workforce (Nardone 1995).

For these reasons, this study considers the period after redesign of the CPS to avoid potential issues of data comparability. Therefore, results from this study should be used with caution when making comparisons with studies that use data prior to 1994.

### **3.2.2. Pooled Cross-Sectional Analysis**

#### **3.2.2.1 Application of the Multinomial Probit Model**

Pooled cross-sectional CPS data from 1996-2005 are used to examine the determinants of part-time labor status using multinomial probit (MNP) models. The multinomial probit model is one of several probability models with discrete dependent variables allowing for more than two outcomes that do not have natural ordering. These models are chosen over multinomial logit models because multinomial probit models assume that the discrete choices are normally distributed. The distinct advantage of this assumption is that it allows for a more realistic correlation structure for the error components, eliminating the IIA (independence of irrelevant alternatives) problem that arises under multinomial logit models. However, the multinomial probit is computationally more intensive to evaluate higher-order (more than two) multivariate integrals, and harder to interpret since it does not provide values similar to the odds ratios of the multinomial logit model. Recent development of accurate simulations of multinomial integrals has made estimation of the multinomial probit model more

feasible (Greene 2003). Moreover, new advances in econometric software technology<sup>29</sup> have made multinomial probit estimation now possible although estimation using the MNP is still a time consuming process.

Multinomial probit techniques are initially used in this dissertation to estimate the probability of being in one of five discrete labor force states: full-time employed, voluntary part-time employed, involuntary part-time employed, unemployed and not at work. Additional analysis that includes self-employment as a labor status is also included in the chapter. Independent variables in the model are hypothesized to affect labor status. The following multinomial probit model is estimated for U.S. households as well as men and women residing in the central cities, suburban areas and non-metro areas.

There are five labor states  $J$  and  $i=1, \dots, n$  individuals in the model. Each individual  $i$  derives utility  $U_{ij}$  from each alternative  $j$ . The random utility structural equations of the MNP as stated in Greene (2003, p.727) are as follows;

$$U_{ij} = x_i' \beta_j + \varepsilon_j, j = 1, \dots, J, [\varepsilon_1, \varepsilon_2, \dots, \varepsilon_j] \sim N[0, \Sigma] \quad (12)$$

where  $J$  = 1 if full-time employment  
           = 2 if unemployment  
           = 3 if involuntary part-time employment  
           = 4 if voluntary part-time employment

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<sup>29</sup> Stata 9 now computes multinomial probit models via the maximum likelihood (ML) approach. Evaluating the likelihood function involves computing probabilities from the multivariate normal distribution. The stochastic error terms for the implementation of the model are assumed to have independent, standard normal distributions. See Stata manual [K-Q] (2005) multinomial probit calculations.

= 5 if not at work

The  $U_{ij}$  is equal to the sum of the systematic components  $x_i\beta_j$  and a stochastic term  $\varepsilon_j$ . The  $X_i$  is the vector (1xk) of observed independent variables for the  $i$ th person, including demographic and economic determinants. The  $\beta$  is the vector (kx1) of parameters.

The log likelihood that corresponds to the choice of alternative  $q$  is

$$\Pr ob[choiceq] = \Pr ob[U_q > U_j, j = 1, \dots, J, j \neq q] \quad (13)$$

meaning that individual  $i$  will choose alternative  $q$  if the utility derived from  $q$  is greater than that for all other alternatives  $j$ . The probability for this occurrence is

$$\Pr ob[choiceq] = \Pr ob[\varepsilon_1 - \varepsilon_q > (x_q - x_1)' \beta, \dots, \varepsilon_j - \varepsilon_q > (x_q - x_j)' \beta] \quad (14)$$

for the  $J-1$  other choices, which is a cumulative probability from a  $(j-1)$  variate normal distribution.

To be able to calculate the results, some simplifications and restrictions are imposed on the multinomial probit model. Since not all  $j$ 's for  $\beta_j$  are identifiable,  $\beta_j$  is set to a zero vector, where 1 (= full-time employment) is the base outcome as specified in the base outcome option. That sets the  $k$ th latent variable to zero so that the remaining variables measure the attractiveness (or unattractiveness) of the other alternatives relative to the base. Category 1 (full-time employment) is chosen as a reference category in the model<sup>30</sup>. Therefore,

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<sup>30</sup> Stata, by default, selects the category as a base category if it has the most observations among alternatives.

the probability of being in any other labor state in the model will be calculated relative to full-time employment.

To interpret the results from multinomial probit models, marginal effects<sup>31</sup> should be calculated. For continuous variables, marginal effects are the partial derivatives of independent variable  $x$  with respect to  $y$  (Greene 2003, p. 668)

$$\frac{\partial y}{\partial x_j} = \lim_{h \rightarrow 0} \frac{f(x_1, \dots, x_j + h, \dots, x_p, \beta_0, \dots, \beta_p) - f(x_1, \dots, x_j, \dots, x_p, \beta_0, \dots, \beta_p)}{h} \quad (15)$$

If a variable of concern is a dummy variable, a difference rather than a derivative is computed. The difference is the value of the prediction function at 1 minus its value at zero.

The marginal effect is a function of only the coefficient of the model because all other variables are held constant. Stata uses the delta method to estimate the variance of the marginal effect:

$$Var \frac{\partial y}{\partial x_j} = D_j' V D_j \quad (16)$$

where  $V$  is the variance-covariance matrix (see details in Greene 2003, p. 70).

The above model is applied to different residential locations (suburban, central city and non-metro areas), for men and women using pooled cross-sectional CPS samples to examine the determinants of labor force status. The March CPS was chosen for this analysis for reasons described in the following section.

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<sup>31</sup> Stata numerically calculates marginal effects and their standard errors after estimation with an `mf` command. By default this command calculates the marginal effects at the means of the independent variables using the default prediction option associated with the previous estimation command.

### 3.2.2.2. Data Analysis and Model Specification

The March Demographic Files of the Current Population Survey (CPS) from 1996 to 2005 is used to examine characteristics of the part-time labor force in the metro and non-metro U.S. in conjunction with the state-level metro/non-metro unemployment rate and real state gross product. For the first part of the analysis, ten years of March CPS Annual Demographic Files including civilian, non-institutionalized individuals who are not full-time students and live in the U.S. (excluding Alaska and Hawaii), aged 18 to 64 are used to create a pooled data set to allow analysis of changes over time. The sampling structure of the CPS files does not allow use of the full sample of surveyed individuals because the sampling is designed such that there is up to a 50% reoccurrence of data from year  $t$  to year  $t+1$ . Therefore, the first four (MIS=1,2,3,4) rotational groups are used for analysis and the last four rotation groups (MIS=5,6,7,8) are excluded from the yearly data to avoid overlapping data problems in a ‘stacked’ data set.

Residential areas in the CPS are defined in several formats. This study uses central city MSA, non-central city MSA (suburban) and non-MSA classifications that are available for each observation in the sample. According to 2002 Methodology and Documentation of the Current Population Survey (available at <http://www.bls.census.gov/cps/ads/2002/smethdoc.htm>), the general concept of metropolitan area (MA)<sup>32</sup> is defined in the CPS as a large population

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<sup>32</sup> The MA (Metropolitan Area) classification is a statistical standard, developed for use by Federal agencies in the production, analysis, and publication of data on MA's. The MA's are designated and defined by the Federal Office of Management and Budget, following a set of official published

center together with adjacent communities that have a high degree of economic and social integration with that center<sup>33</sup>. Each metropolitan area must contain either a place with a minimum population of 50,000 or a Census Bureau-defined urbanized area and a total metropolitan area population of at least 100,000<sup>34</sup>. A metropolitan area might include one or more counties that have close economic and social relationships with the central county. The territory, population, and housing units in a metropolitan area are referred to as "metropolitan." The metro category is subdivided into "inside central city" and "outside central city." The territory, population, and housing units located outside metropolitan areas are referred to as "non-metropolitan" (or non-metro). Central cities are defined in each MSA as the largest place. The largest central city and, in some cases, up to two additional central cities are included in an MSA. Any part of the central city that is not in the designated MSA is not included in that MSA. Using the above definitions, census blocks in the CPS are classified and used in this dissertation as central city (central city of MSA), suburban (non-central city MSA), and non-metro (non-MSA).

#### **3.2.2.2.1. Variable Construction**

Labor market status is the dependent variable in all estimated models, and critical to construct. The CPS uses different questions to identify the current labor

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standards. These standards were developed by the interagency Federal Executive Committee on Metropolitan Areas, with the aim of producing definitions that are as consistent as possible for all MA's nationwide. <http://www.census.gov/population/www/cps/cpsdef.html>

<sup>33</sup> Some MA's are defined around two or more nuclei.

<http://www.census.gov/population/www/cps/cpsdef.html>

<sup>34</sup> 75,000 in New England <http://www.census.gov/population/www/cps/cpsdef.html>

state of a person and hours worked during the specified period. In the CPS, some information is collected from ‘last week’ and some information refers to the ‘last year’. There are also definitions of part-year and full-year workers. The basic challenge was to decide which questions and definitions would best fit in the context of a study of voluntary and involuntary part-time employment. This study focuses on the ‘last week’ information because the CPS ‘part-time for economic reason’ and ‘part-time for non-economic reason’ data are collected for the reference week (last week) of the survey ([www.bls.census.gov/cps/bconcept.htm](http://www.bls.census.gov/cps/bconcept.htm)). The ‘last week’ questions refer to the week before the survey was conducted and include questions such as hours worked, number of jobs, and main reason for being in current labor market status, as examples. Also the last week questions are more consistent with data on unemployment rates, since the BLS constructs these variables using the ‘last week’ questions from the CPS.

Using the new information available from the race and ethnicity questions, black and white Hispanic variables are created to control for race/ethnicity effects. New questions in the CPS in 2003 added categories of more than two origins and expanded the origin questions from the previous 7 categories to 21 new categories including more than two origins. Using frequency analysis, historical trends and sampling information from the CPS documentation, black Hispanic, white Hispanic and other race/ethnicity variables were created. However, in non-metro areas, the distribution of black Hispanics is very small, creating model

convergence problems for the analyses. Thus, in these areas, black Hispanic and white Hispanic categories are reduced to one variable, Hispanic.

The metro/non-metro unemployment rate variable is constructed using Bureau of Labor Statistics' Local Area Unemployment Statistics county-level annual historical unemployment rate data. Data are available through 2004. Using metro/non-metro continuum codes (Beale codes)<sup>35</sup>, each county is assigned numbers from 0(1)<sup>36</sup> to 9 to determine their residential status via merging continuum codes and unemployment rates. However, due to the recoding in 2003, there were some changes in metro/non-metro status of some counties. Counties are assigned 1993 Beale codes for the period 1996 to 2002 and 2003 continuum codes are assigned to the period after 2002. Continuum codes less than 3 are classified as metro and 4 to 9 are classified as non-metro. After assigning the codes to the county-level unemployment rate, weighted averages of metro and non-metro counties are calculated for each state. The calculated metro/non-metro unemployment rate for each state from 1996 to 2004 are merged to the CPS data set using the metro/non-metro status variable and state codes by year.

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<sup>35</sup>Rural-urban continuum codes distinguish metropolitan (metro) counties by the population size of their metro area, and non-metropolitan (non-metro) counties by degree of urbanization and adjacency to a metro area or areas. The metro and non-metro categories have been subdivided into three metro and six non-metro groupings, resulting in a nine-part county codification. The codes allow researchers working with county data to break such data into finer residential groups beyond a simple metro/non-metro dichotomy, particularly for the analysis of trends in non-metro areas that may be related to degree of rurality and metro proximity. More information is available in <http://www.ers.usda.gov/Briefing/Rurality/RuralUrbCon/>

<sup>36</sup> Due to the code change in 2003, years after 2003 were coded 1 to 9 unlike previous codes of 1993 from 0 to 9.



### **3.2.2.2.2. Dependent Variable**

The dependent variable for the initial set of models is the individual's current labor force status, which is a categorical variable. For the first set of models, current labor force status is defined in five labor states: 1) full-time employed, 2) involuntary part-time employed, 3) voluntary part-time employed, 4) unemployed, and 5) not at work. The CPS defines unemployed as those who have no current employment during the survey week but are available for work.

All civilians who, during the survey week, did any work at all as paid employees or in their own business or profession, or on their own farm, or who work 15 hours or more as unpaid workers on a farm or a business operated by a member of the family; and all those who have jobs but who are not working because of illness, bad weather, vacation, or labor-management dispute, or because they are taking time off for personal reasons, whether or not they are seeking other jobs are classified as employed. Those who are working 35 hours or more are classified as full-time workers. People who work less than 35 hours a week are classified as part-time workers and further classified as either involuntary or voluntary part-time workers. Those who have jobs but who are not working because of illness, bad weather, vacation, or labor-management disputes, or because they are taking time off for personal reasons, are defined in the not at work category.

The question of the reason for working less than 35 hours a week further classifies those who are working part-time as ‘part-time for economic reason’ and ‘part-time for non-economic reason’. Voluntary part-time employees are defined as employees who worked 1 to 34 hours during the survey week for non-economic reasons which include illness or other medical limitations, childcare problems or other family or personal obligations, school or training, retirement or a Social Security limit on earnings, and being in a job where full-time work is less than 35 hours. This group also includes those who gave an economic reason for usually working 1-34 hours, but said they do not want to work full-time or were unavailable for such work (CPS technical documentation 63rv, 2002). The CPS defines involuntary part-time employees as those who gave an economic reason for working 1-34 hours during the survey week, but usually work full-time and were working part-time during the survey week due to slack work or unfavorable business conditions, inability to find full-time jobs, and seasonal declines in demand. Those who usually work part-time must indicate that they want and are available to work full-time to be classified as involuntary part-time workers (CPS technical documentation 63rv, 2002, p. 48).

Using the above defined labor force categories, the LFS (labor force status) variable is created as a dependent variable. LFS is a categorical variable taking values 0 to 4 indicating the labor force categories: 0=full-time, 1=unemployed, 2=involuntary part-time employed, 3=voluntary part-time employed, 4=not at work. This variable is used with the full sample of the U.S.

civilian labor force aged 18-64 as well as samples for women; men; women living in the central city, suburban and non-metro areas; men living in the central city, suburban and non-metro areas.

### **3.2.2.2.3. Independent Variables**

The characteristics expected to influence labor force status are classified into three categories; 1) personal and demographic characteristics such as age, race, gender, education, marital status, number of children, 2) geographic characteristics such as region and MSA status and 3) characteristics of the economy such as the unemployment rate and per capita real state gross product. While personal and demographic and geographic characteristic variables are included in the CPS data set, economic variables reflecting economic conditions are drawn from data available from the Bureau of Labor Statistics and the Conference Board. The following discussion focuses on the expected effects of independent variables in the model. All variables are defined in Table 3.1.

Gender is one of the important factors that is expected to determine the labor force status of a person. Women are expected to be more likely to engage in both voluntary part-time work and involuntary part-time work relative to men. Men are expected to be employed in full-time jobs. Age is included as age in years and age-squared as a continuous variable in all models to capture a life-cycle effect. The likelihood of being in one of the five employment states is expected to differ by age. Increasing age is expected to increase labor force participation (and hours of work) up to middle age and then participation after

**Table 3.1. Variable Definitions**

<b>Variable</b>	<b>Name</b>	<b>Variable definition</b>	<b>Source</b>
Age	A_age	Continuous variable, with values from 18 to 64	CPS
Gender	Male	Dummy variable if a person is male	CPS
	Female	Dummy variable if a person is female	CPS
Marital status	Married spouse working	Dummy variable for individual currently married with spouse working	CPS
	Married spouse not working	Dummy variable for individual currently married with spouse not working	CPS
	Evermarried	Currently not married including widowed, divorced or separated	CPS
	Nevermarried	Dummy variable for never-married person	CPS
Residential status	Central	Dummy variable for metro-central city resident	CPS
	Metro	Dummy variable for non-central city (metro) resident	CPS
	Non-metro	Dummy variable for non-metro area resident	CPS
	Nonstat	Dummy variable for residential status not known	CPS
Region	Northeast	Dummy variable for Northeast (U.S.)	CPS
	Midwest	Dummy variable for Midwest	CPS
	South	Dummy variable for South	CPS
	West	Dummy variable for West	CPS
Presence of children	Child6	Dummy variable for presence of children under 6 years old	CPS
	Child18	Dummy variable for presence of children 18 and under	CPS
	Child6-18	Dummy variable for presence of children between 6-18	CPS
	Nonchild	Dummy variable for no presence of children	CPS
Self-employment	Self-employed	Dummy variable if an individual is self-employed	

**Table 3.1. Variable Definitions (continued)**

Variable	Name	Variable definition	Source
Education	Lthighschool	Dummy variable for less than high school education	CPS
	Highschool	Dummy variable for high school graduate	CPS
	Somecollege	Dummy variable for some college education including associate degree	CPS
	College Graduate	Dummy variable for college graduate including masters, doctorate and professional	CPS
Race/ethnicity	White	Dummy variable for nonHispanic white	CPS
	Black	Dummy variable for nonHispanic black	CPS
	WhiteHispanic	Dummy variable for white Hispanic	CPS
	BlackHispanic	Dummy variable for black Hispanic	CPS
	Hispanic	Dummy variable for Hispanic including both white and black Hispanic	CPS
Citizenship	Others	Dummy variable for all other race and ethnicity groups	
	Natcitz	Dummy variable for native-born citizen including Puerto Rican and born-abroad American citizens	CPS
	Frbcitz	Dummy variable for foreign-born U.S. citizen by naturalization.	CPS
Time	Foreigner	Dummy variable for foreign-born non-U.S. citizen with permit to work in U.S.	CPS
	Mtime	Variable for year from 1996 to 2005, 1996 being 1 and 2005 being 10	CPS
Unemployment rate	Ruunemprt	Continuous variable for metro unemployment rate and non-metro unemployment rate depending on location of residence	BLS (CPS)
Per capita real state gross product	Rgsp	Per capita real state gross product	Conference Board

**Table 3.1. Variable Definitions (continued)**

<b>Variable</b>	<b>Name</b>	<b>Variable definition</b>	<b>Source</b>
Labor force status	Fulltime	Dummy variable for individual who worked 34+ hours during the reference week	CPS
	Ivpt	Dummy variable for individual who worked less than 35 hours during the reference week involuntarily due to economic reasons including slack work, unfavorable business conditions, inability to find full-time work, and seasonal decline in demand	CPS
	Vpt	Dummy variable for individual who worked less than 35 hours during the reference week voluntarily or for non-economic reasons.	CPS
	Unemployed	Dummy variable for individual unemployed during the reference week	CPS
	Not at work	Dummy variable for a person who is identified in civilian labor force and has a full-time or part-time job but is not currently at work.	CPS

that age is expected to stabilize or even to decrease. However, this effect is expected to be different for men and women since women during the child-bearing years may prefer to move to (voluntary) part-time jobs due to family responsibilities. Since the function is expected to be concave, age-squared is included in the model.

Education is expected to have a positive impact in favor of full-time work participation relative to either voluntary or involuntary part-time work participation. Although recent research has shown that some highly-educated professionals now work reduced hours, it is still expected that the higher the educational investment, the higher will be the expected return. To earn a higher return for their investment, workers with more education are expected to prefer full-time work.

As shown by much of the part-time labor market literature, having a young child present is expected to have a significant effect on labor market status especially for women. Evidence from previous research shows that having a child decreases women's work hours while increasing men's. Therefore, while it is expected that women with children are more likely to work voluntarily part-time than full-time as compared to other women and men, men with children are expected to have the opposite relationship. Therefore, it is expected that men with young children are more likely to work full-time. Although the effect is not very clear and also depends on other factors, if full-time jobs are not available those with children may be willing to take involuntary part-time jobs until full-time jobs

become available. Marriage is also expected to have impacts on individual's labor market status. It is expected that marriage will have positive effect on being in involuntary part-time labor status for men, and also a positive effect on being in voluntary part-time labor market status for women. It is also expected that men are more likely to want to work full-time than part-time in either type of part-time job.

Race/ethnicity is expected to determine the labor market status of men and women. Opportunities for nonHispanic black, and Hispanic black and white men and women are hypothesized to be much more limited than for their nonHispanic white counterparts. Previous literature has shown that gender as well as race/ethnicity can be important factors contributing to underemployment, especially among those with fewer skills and less education (DeJong, 2001).

Region of residence is also expected to influence labor force status. Previous literature has shown that employment opportunities and types of work greatly differ across regions of the U.S. Demand-side factors are expected to play important roles for determining the labor force status of an individual. Therefore, state-level metro/non-metro unemployment rates and per capita real gross state product variables are included in the models. It is expected that the lower the unemployment rate, the lower the probability of being and involuntary part-time worker. Similarly, a higher unemployment rate means more (involuntary) part-time job possibilities. The real gross state product (RGSP) is annually available from the Conference Board for each state. For each state, the real gross state



product is converted to a per capita measure. RGSP is an inflation-adjusted measure of each state's gross product that is based on national prices for the goods and services produced within that state<sup>37</sup>. As opposed to the unemployment rate, a higher per capita real gross state product is an indicator of a better and stronger economy which is related with higher full-time job opportunities. Growth in the per capita real gross state product is expected to reduce involuntary part-time employment, increasing full-time employment.

The last but most critical component is the residential status of the worker. Metro, non-metro and the central city locations were considered in past research on part-time labor markets and underemployment. Leppel and Clain (1993) in their work on the determinants of voluntary and involuntary part-time employment control the analysis for metro and non-metro areas and find that both voluntary and involuntary part-time workers in non-metro areas are more disadvantaged than their metro counterparts. However, they did not look for specific advantages and/or disadvantages of different residential settings. Findeis et al. (1998), Jensen et al. (1999), Vera-Toscano et al. (2004) in their analyses of underemployment consider metro non-central city, non-metro, and metro central city definitions and report that the non-metro underemployed are more disadvantaged than their metro counterparts, even those in the central cities for

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<sup>37</sup> The estimates of real GSP and of quantity indexes with a base year of 2000 are derived by applying national implicit price deflators to the current-dollar GSP estimates for the 81 NAICS industries for years 1997 forward and for the 63 SIC industries for years 1977-1997. Then, the chain-type index formula that is used in the national accounts is used to calculate the estimates of total real GSP and of real GSP at more aggregated industry levels. <http://www.bea.gov/nea/newsrel/gspnewsrelease.htm>

some forms of underemployment. As previously shown, less populated areas are expected to be more disadvantaged. Differences between non-metro areas and the metro central cities are of the greatest interest in this study in terms of involuntary part-time employment due to potential disadvantages and barriers found in these areas.

### **3.2.3. Dynamic Analysis of the Part-time Labor Market: Transitions Into and Out of Involuntary Part-time Jobs**

Discrete choice models of employment transitions can be used to examine important factors that are associated with transitions from one labor state to another state. Although longer longitudinal data analysis would be optimal for understanding the dynamics of movements by tracking past experience and employment spells, the CPS is chosen for the analysis because other available longitudinal data sources have small sample sizes and do not include involuntary part-time employment as a labor force status category. In total, eight pairs of matched and pooled data spanning the nine year of period from 1996 to 2004 are used to analyze part-time labor market dynamics. Definition of data and the matching process are explained in detail at the end of this section (section 3.2.3.3.). The probability of transition as a function of personal and demographic characteristics, labor market characteristics and geographic characteristic variables, and economy variables is determined for set of alternative transitions.

### **3.2.3.1. Transitions Into Involuntary Part-time Employment**

The first set of models examines transitions into the involuntary part-time employment state in year  $t+1$  from full-time employment, voluntary part-time employment, unemployment, not at work and not in the labor force in year  $t$ .

Binomial probit models are estimated to identify those factors affecting transitions into involuntary part-time employment. The models are shown in Figure 3.4.

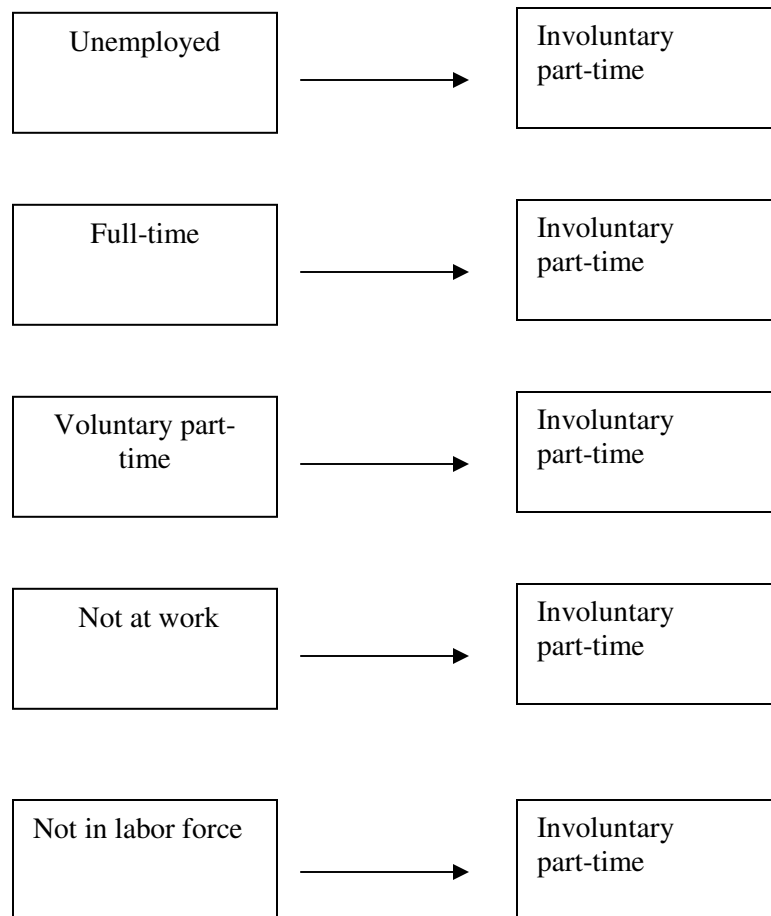
Binomial probit models can be used to examine which characteristics are predictive of moving into involuntary part-time employment. The dependent variable in the model is dichotomous taking a value of 1 if a worker has involuntary part-time employment and 0 otherwise at  $t+1$ . Samples are limited to the labor force status group that is studied in that specific relation.

As shown in Figure 3.4, the following five transition models into involuntary part-time employment status are estimated:

- 1- from unemployment into involuntary part-time employment
- 2- from full-time employment into involuntary part-time employment
- 3- from not in labor force into involuntary part-time employment
- 4- from voluntary part-time employment into involuntary part-time employment
- 5- from not at work into involuntary part-time employment

To examine the effects of different characteristics of labor on transitions of a worker, the above framework is estimated using matched and pooled CPS data.

**Figure 3.4. Transitions into Involuntary Part-time Jobs**



### 3.2.3.2. Transitions Out of Involuntary Part-time Jobs

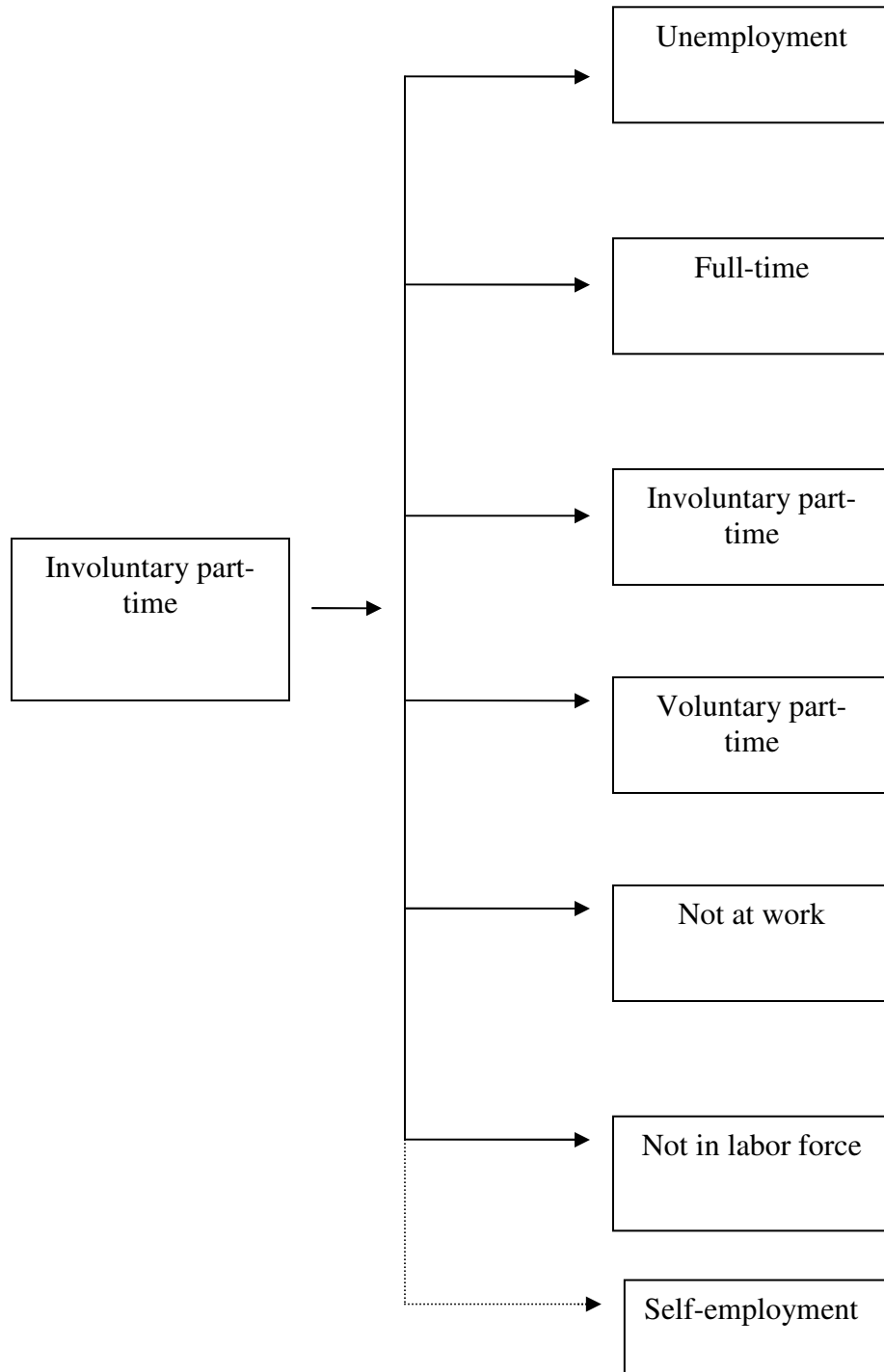
The second set of models examine transitions from involuntary part-time employment at year t to full-time employment, part-time voluntary employment, unemployment, not at work, not in labor force or staying in the involuntary part-time employment state in year t+1 (see Figure 3.5). Additional model is estimated differentiating self employment, and wage and salary employment. The observations in these models are limited to individuals whose first-year status is determined as involuntary part-time. Therefore, transition probabilities are estimated conditional upon being in involuntarily part-time employment in year t. These models are estimated for different residential areas to assess if factors affecting the probability of transition differ across non-metro, central city and suburban areas as well as between men and women. To calculate probabilities, multinomial probit models with short panel data are estimated.

As in the previous section, the model specification is based on random utility theory in which person i derives utility  $U_{ijt}$  if he/she choose to be in the jth labor market status at time t. A person i chooses labor market status q at time t, if  $U_{qt} > U_{jt}$ , meaning that the utility derived from q is greater than that for all other alternatives j. That is:

$$\Pr ob[choiceq] = \Pr ob[U_{qt} > U_{jt}, j = 1, \dots, J, j \neq q] \quad (17)$$

The probability for this occurrence depends on the distribution of the error term.

**Figure 3.5 Transitions Out of Involuntary Part-time Employment**



This is also the difference between the logit and probit models. If we assume that the error term is an independent, uncorrelated, type 1 extreme value distribution, we obtain the conditional logit model of McFadden (Paap, et al, 2000). This brings the assumption of IIA (independence of irrelevant alternatives). To avoid the IIA, multinomial probit models assume that the  $j$  dimensional disturbance vector  $\varepsilon_{jt}$  is normally distributed.

As we assume that current labor market status is determined by utility differences, it is possible to measure one's utility from current status relative to the alternative  $j$  to identify parameters in the model. Therefore, below can be defined:

$$U_{iqt} - U_{ijt} = X'_{ijt}(\beta + \beta_i) - X'_{ijt}(\beta + \beta_i) + \varepsilon_{ijt} - \varepsilon_{iqt} \text{ for } j = 1, \dots, J - 1 \quad (18)$$

where relative utility of labor market status  $q$  is calculated relative to utility of  $j$ . Person  $i$  chooses status  $q$  if  $U_{iqt} - U_{ijt}$  is the maximum of relative utilities unless all relative utilities of other labor market states are zero.

$$U_{ijt} = x_{it}\beta_j + \varepsilon_{jt} \sim N[0, \Sigma] \quad (19)$$

This was the static specification and is the same as the first set of models except that time  $t$  is added to the model. To make the model dynamic, the dependent variable at  $t+1$  (labor market status at time  $t+1$ ) and independent variables at  $t$  are included in the model. Moreover, the sample is restricted in the model with the time  $t$  labor force status of a person.

Dependent and independent variables in the models are similar to the previous section. In these models, the ‘not in the labor force’ category is included as one of the choices in the dependent variable, since a significant number of transitions occurs between the involuntary part-time labor force status and the not in the labor force category. Also, the demand side variables—i.e., the metro/non-metro unemployment rate and the per capita real gross state product -- are included as changes from year  $t$  to year  $t+1$ . The sample for this analysis is restricted to workers whose employment status at time  $t$  is involuntary part-time work.

### **3.2.3.3. Matched and Pooled Samples of CPS**

As mentioned previously, the CPS is a monthly survey using a probability sample of households. Different from most other cross-sectional data sets, the CPS samples are divided into eight representative sub-samples called rotation groups. Each rotation group in the monthly sample is defined by month in sample (MIS) in the large data set. Each rotation group is interviewed for 4 consecutive months, the next 8 months are dropped from the survey, are again interviewed for another 4 consecutive months and then leave the survey. Therefore, every month 1/8 of the sample is new to the survey (MIS=1), 1/8 of the sample is interviewed for a second month (MIS=2), and so forth. The following figure (Figure 3.6) shows the rotation groups and how they overlap. For example, rotation group B is first interviewed in January 1996 (MIS=1) and subsequently interviewed, February (MIS=2), March (MIS=3) and April (MIS=4). The respondent then leaves the



survey for 8 months and returns January 1997 as MIS=5 and subsequently February (MIS=6), March (MIS=7), and April (MIS=8). After that the respondent leaves the sample permanently. Focusing on March 1997, it is possible to see all overlapping rotation groups in order and together. Since March surveys are used for matching, rotation groups D(1), C(2), B(3), A(4) in March 1996 are matched with D(5), C(6), B(7), A(8) in March 1997 in Figure 3.6. Under this system, 75% of the population is common from month to month and 50% is common from year to year (Madrian and Lefreng 1999). Therefore, using this sampling design, it is possible to match the first 4 (MIS=1,2,3,4) rotation groups in year  $t$  with the last 4 (MIS=5,6,7,8) rotation groups in year  $t+1$ , at the same month. As might be expected the actual matching rate is lower than the theoretical match rate. Among others, Madrian and Lefreng (1999) and Feng (2003) developed matching algorithms for the CPS and found that the actual matching rate is lower than the expected matching rate due to non-response households (about 6-7 percent), mortality (about 15% over 85 years old), migration (15% -20%) and recording errors (Madrian and Lefreng 1999). Feng (2003) developed a method to detect recording error in the CPS and rematched samples with significant improvement. Feng (2003) developed an algorithm for reducing possible recording errors for age, sex and race. Combinations of matching criteria from Madrian and Lefreng (1999) and Feng (2003) are used here.

**Figure 3.6 Sample Design and Illustration of Rotation Groups in the CPS**

Month and year	Rotation Groups (month in sample)							
	MIS=1	MIS=2	MIS=3	MIS=4	MIS=5	MIS=6	MIS=7	MIS=8
December 95	A							
January 96	B	A						
February 96	C	B	A					
March 96	D	C	B	A				
April 96	E	D	C	B				
May 96	F	E	D	C				
June 96	G	F	E	D				
July 96	H	G	F	E				
August 96	I	H	G	F				
September 96	J	I	H	G				
October 96	K	J	I	H				
November 96	L	K	J	I				
December 96	M	L	K	J	A			
January 97	N	M	L	K	B	A		
February 97	O	N	M	L	C	B	A	
March 97	P	O	N	M	D	C	B	A
April 97		P	O	N	E	D	C	B
May 97			P	O	F	E	D	C
June 97				P	G	F	E	D
July 97					H	G	F	E
August 97					I	H	G	F
September 97					J	I	H	G
October 97					K	J	I	H
November 97					L	K	J	I
December 97					M	L	K	J
January 98					N	M	L	K
February 98					O	N	M	L
March 98					P	O	N	M
April 98						P	O	N
May 98							P	O
June 98								P
July 98								

One of the largest problems in the matching process is losing information about movers. This is important since we are studying involuntary part-time workers. The 4-8-4 design is based on dwelling units. Therefore, if the family moves out and a new family moves in, matching is not possible or possible false matching occurs due to recording errors (i.e., same household number). This creates potential biases from sample attrition and measurement errors (Neumark and Wascher 1997, Neumark and Kawaguchi 2001). However, as argued by researchers the advantages of using longitudinal samples of the CPS likely outweigh the disadvantages from attrition bias (Neumark and Kawaguchi 2001). Again, to avoid measurement errors this study follows the combination of matching algorithms of Madrian and Lefreng (1999) and Feng (2003).

Previous matching algorithms included unique identifiers such as the household identifier (HHID) and individual line number within household (LINENO). As Madrian and Lefreng (1999) point out HHID and LINENO do not necessarily identify the individual across time because the same combination might be given to a different CPS respondent if the previous one moved away. The household number (HHNUM) is designed to solve this issue. However, the HHID, LINENO and HHNUM combination is also not necessarily unique due to potential recording errors. If these problems are not corrected during the matching process, false matches could occur. Therefore, as suggested in previous literature, new matching criteria are added to allow the closest actual match. These variables are gender, race and age. Gender and race are constant over time

and age is increasing +1 by year but we accept 0-3 years of increase. The combination of the Madrian and Lefreng (1999) and Feng (2003) algorithms are used in the following format. Firstly, the first 4 and last 4 rotational groups of two consecutive years of March surveys are merged by HHID, HHNUM and LINENO and then gender, race, and age criteria are imposed by excluding merges for which any two of the following is true simultaneously: 1) if gender differs, 2) if race differs, 3) if the difference in age between  $t$  and  $t+1$  is less than  $-1$  or greater than 3. Results of the two matching rates are reported below table (Table 3.2).

The first column of Table 3.2 refers to the naïve matching rate or matching that is done using HHID, HHNUM, and LINENO and the second column refers to the actual rate that is calculated using age, gender and race criteria. Using the above matching process nine matched data files are created: 1996-1997, 1997-1998, 1998-1999, 1999-2000, 2000-2001, 2001-2002, 2002-2003, 2003-2004, 2004-2005. The matched files include civilian, non-institutionalized individuals who are not full-time students and not self-employed, living in the U.S. aged 18 to 64 whose labor force status is followed between years  $t$  and  $t+1$ . For each person, the same variables as mentioned in the previous section of this chapter refers to the cross-sectional samples of the CPS are extracted and assigned a prefix  $t$  for the first 4 rotation groups and  $t+1$  for the last four rotation groups. Since there are two different observation points (years) for each person, the structure of panel data has twice the record number for each person. These files are then stacked together for the analyses.

**Table 3.2. Naïve and Actual Matching Rates for the Current Population**

**Survey Year Pairs 1996-1997 through 2004-2005**

Matching years	Naïve merge percentages	Real merge percentages
1996-1997	66.5%	65.5%
1997-1998	65.9%	65.0%
1998-1999	65.8%	65.0%
1999-2000	66.3%	65.2%
2000-2001	70.5%	69.8%
2001-2002	74.7%	68.7%
2002-2003	60.0%	50.8%
2003-2004	62.7%	55.9%
2004-2005	53.8%	48.8%

Source: CPS March Annual Demographic Files 1996-2005

## **CHAPTER 4**

### **DESCRIPTIVE ANALYSIS**

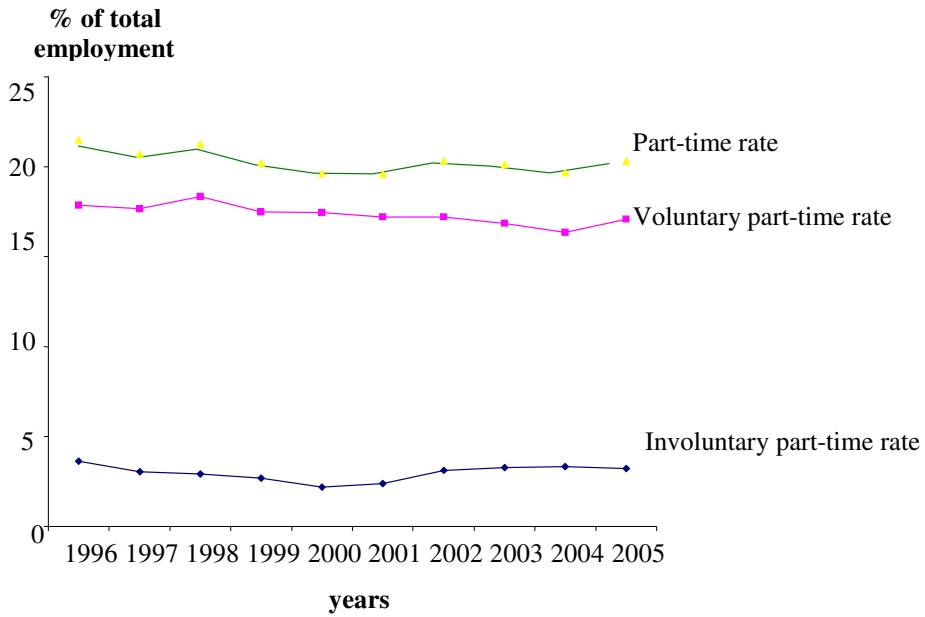
#### **4.1. Descriptive Profiles of Involuntary and Voluntary Part-time Labor**

Descriptive profiles of involuntary and voluntary part-time workers are first examined including demographic and geographic characteristics and historical trends. Since differences among central city metro, non-central city metro (suburban) and non-metro areas are of particular interest, the analyses of labor force status of men and women focus on comparisons by residence using the 1996-2005 March CPS files. The descriptive statistics and tables are calculated using weighted cross-sectional CPS data for the sample of civilian non-institutionalized, non-student U.S. population aged 18 to 64 years, inclusive.

##### **4.1.1. Trends**

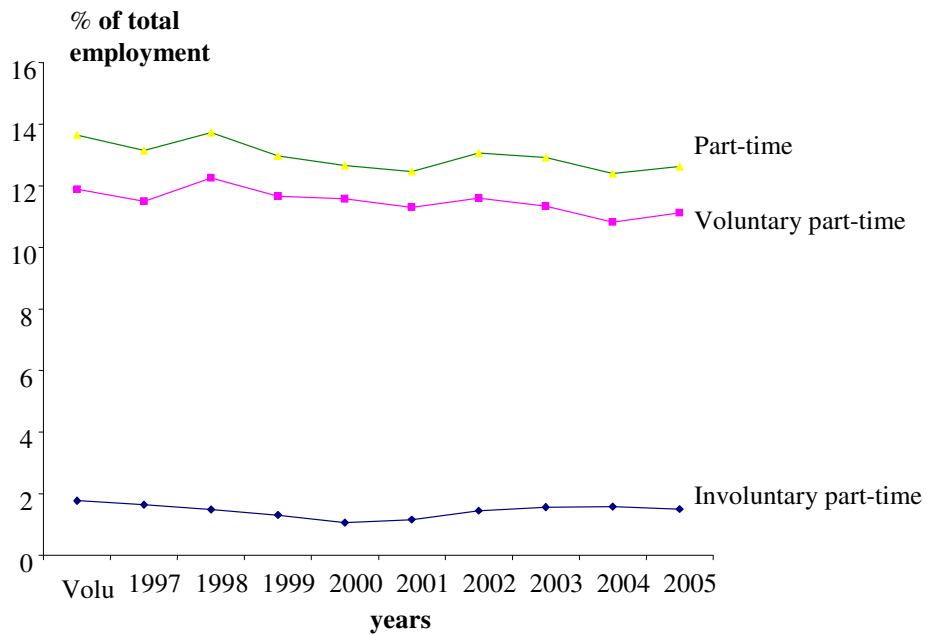
Figures 4.1-4.5 show time trends in the percent of the total population that is employed part-time in the U.S., as well as the percentages employed as voluntary and involuntary part-time workers using data from the 1996-2005 March CPS files. Figure 4.1 summarizes the data for the whole U.S. population as a percent of total employment. Figures 4.2 and 4.3 present data for female and male workers as percentages of total labor force, respectively.

**Figure 4.1. Employment Trends for U.S. Voluntary and Involuntary Part-time Workers, 1996-2005 March CPS**



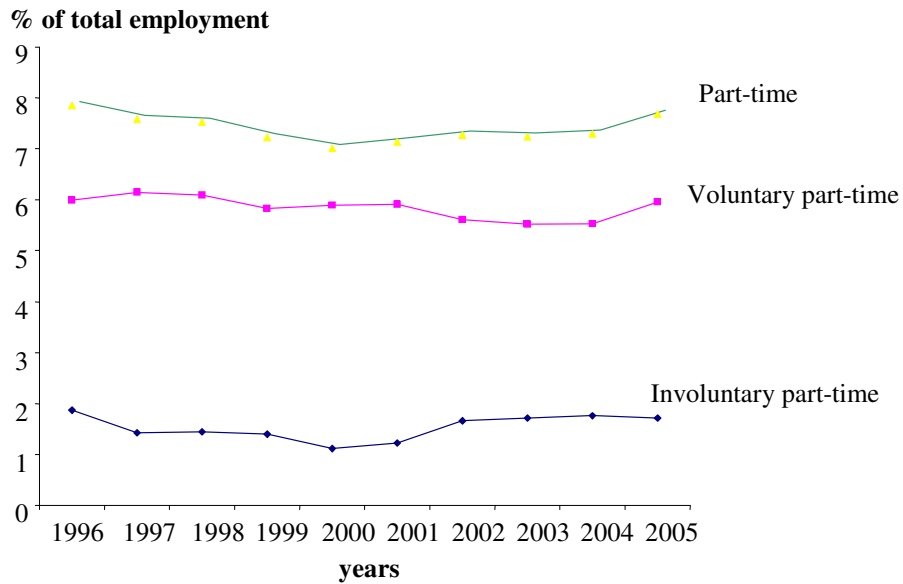
Source: CPS Annual March Demographic Files (age 18 and above civilian labor force). Weighted data.

**Figure 4.2. Employment Trends for U.S. Female Voluntary and Involuntary Part-time Workers, 1996-2005 March CPS**



Source: CPS Annual March Demographic Files (age 18 and above civilian labor force). Weighted data.

**Figure 4.3. Employment Trends for U.S. Male Voluntary and Involuntary Part-time Workers, 1996-2005 March CPS**



Source: CPS Annual March Demographic Files (age 18 and above civilian labor force). Weighted data.



Voluntary and involuntary part-time participation rates follow different patterns historically (Figure 4.1). While the voluntary part-time participation rate ranges between 16% and 19% as a percent of total employment over the last 10 years, the involuntary part-time participation rate varies between 2% and 4%. Consistent with the previous research, female voluntary part-time work participation rates as a percent of total labor force are almost double the male voluntary part-time work participation rates, likely reflecting other work obligations of women (e.g., child care). Trends for involuntary part-time work participation rates as a percent of total labor force of both men and women are largely comparable across genders, illustrating a different behavior pattern from voluntary part-time workers.

*The increasing and decreasing patterns of involuntary part-time labor participation are observed to be parallel to patterns of the unemployment rate in the U.S. economy.*<sup>38</sup> Previously, Ratti (1991) showed that an increasing unemployment rate is associated with a rise in involuntary part-time employment. Between 1996 and 2005, the unemployment rate was lowest in 2000; the same is true for the involuntary part-time labor participation rate for men and women in the U.S. Voluntary part-time employment, however, follows a different historical

<sup>38</sup> According to the Bureau of Labor Statistics, annual unemployment rates for the U.S economy for the period 1996 through 2005 are as follows:

year	%	year	%	year	%
1996	5.4	1999	4.2	2002	5.8
1997	4.9	2000	4.0	2003	6.0
1998	4.5	2001	4.7	2004	5.5

Source: [http://www.bls.gov/cps/prev\\_yrs.htm](http://www.bls.gov/cps/prev_yrs.htm)

cycle than involuntary part-time employment since its dynamics are more likely related to personal preferences and household characteristics than to the economy itself.

Table 4.1 presents the distribution of the U.S. civilian labor force by gender among five different labor states: full-time employed, unemployed, involuntary part-time, voluntary part-time and not at work<sup>39</sup> by years, whereas Table 4.2 provides the same distribution decomposed by gender *within* a particular labor state. In Table 4.1, the relationship between the unemployment rate and the involuntary part-time employment rate is noticeable; that is, an increase in the unemployment rate corresponds to an increase in the involuntary part-time rate (a decrease in the unemployment rate corresponds to a decrease in the involuntary part-time rate).

In Table 4.2, the *full-time employment rate among men is about 20 percentage points higher than the same rate for women*, whereas the *voluntary part-time employment rate of women is almost double that of men*. The unemployment rate in the U.S. has been generally higher among men than women. However, *involuntary part-time employment rates among men and women are comparable, differing by less than 1 percent*. This is an interesting finding and is further investigated in the multinomial probit model section of the next chapter.

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<sup>39</sup> Not at work includes people who are in the civilian labor force and have full-time or part-time jobs but are not currently at work.

**Table 4.1. Labor Force Participation Rates of U.S. Civilian Labor Force Across Labor States, 1996-2005 March CPS**

Years	<u>Full-time</u>		<u>Unemployed</u>		<u>Involuntary part-time</u>		<u>Voluntary part-time</u>		<u>Not at work</u>	
	men	women	men	women	men	women	men	women	men	women
1996	76.22	61.70	6.64	4.92	3.49	3.81	11.19	25.60	2.47	3.97
1997	77.70	62.99	5.79	4.95	2.68	3.50	11.54	24.60	2.30	3.95
1998	78.01	62.08	5.24	4.54	2.69	3.18	11.41	26.29	2.66	3.91
1999	78.98	64.22	4.64	4.42	2.63	2.80	11.01	24.80	2.74	3.76
2000	79.77	64.80	4.21	4.00	2.12	2.26	11.12	24.58	2.77	4.34
2001	78.57	65.58	5.18	4.10	2.33	2.47	11.23	23.89	2.69	3.96
2002	76.81	62.82	6.60	5.59	3.14	3.11	10.58	24.69	2.86	3.79
2003	76.96	63.27	6.96	5.68	3.24	3.36	10.38	24.20	2.46	3.50
2004	77.31	64.45	6.38	5.41	3.30	3.38	10.39	23.11	2.62	3.65
2005	77.31	64.25	5.86	5.10	3.20	3.24	11.12	23.96	2.50	3.45

Source: CPS Annual March Demographic Files (age 18 and above civilian labor force). Weighted data.

**Table 4.2 Labor Force Participation Rates of Men and Women in U.S. by Labor State, 1996-2005 March CPS<sup>a</sup>**

Years	<u>Full-time</u>		<u>Unemployed</u>		<u>Involuntary part-time</u>		<u>Voluntary part-time</u>		<u>Not at work</u>	
	Men	women	men	women	men	women	men	women	men	women
1996	58.79	41.21	60.91	39.09	51.34	48.63	33.53	66.47	41.78	58.22
1997	58.43	41.57	57.14	42.86	46.52	53.48	34.82	65.18	39.88	60.12
1998	59.03	40.97	56.94	43.06	49.24	50.76	33.22	66.78	43.78	56.22
1999	58.09	41.91	54.21	45.79	51.49	48.51	33.35	66.65	45.15	54.85
2000	58.04	41.96	54.15	45.85	51.26	48.74	33.71	66.29	41.79	58.21
2001	57.16	42.84	58.48	41.52	51.22	48.78	34.34	65.66	43.08	56.92
2002	57.96	42.04	57.11	42.89	53.24	46.76	32.59	67.41	46.00	54.00
2003	57.99	42.01	58.16	41.84	52.32	47.68	32.73	67.27	44.38	55.62
2004	57.67	42.33	57.27	42.73	52.60	47.40	33.81	66.19	44.88	55.12
2005	58.16	41.84	54.04	42.96	53.33	46.67	34.92	65.08	45.60	54.40

Source: CPS Annual March Demographic Files (age 18 and above civilian labor force). Weighted data.

<sup>a</sup> For any particular labor state, the sum of the two columns for males and females is 100%, although minor rounding differences may exist.

Table 4.3 outlines the distributions by residence, for men and women to provide the underlying profiles of labor force participation by residence. These profiles show different behaviors of men and women across residential areas. Unlike other labor states, full-time employment is consistently highest in suburban areas for men and highest in the central cities for women. However, the unemployment rate is also highest in the central cities for women and is always lowest in suburban areas for both men and women. About 10-12 percent of men across years are employed voluntarily part-time and these rates do not vary significantly by residential status. Women living in the central cities have the lowest voluntary part-time employment rate compared to women living in suburban or non-metropolitan areas. As previously suggested by the underemployment literature, the central cities and non-metropolitan areas have the highest involuntary part-time employment rates compared to suburban areas (Jensen et al. 1999). Among women, the highest involuntary part-time employment rates are in the non-metro areas followed by the central cities, and the lowest involuntary part-time rates are in suburban areas. However among men, the highest involuntary part-time employment rates fluctuate between the central cities and non-metro areas over this time period.

In summary, descriptive Tables 4.1-4.3 show that *women already in the labor force are less likely to be employed on a full-time basis and more likely to be among the voluntarily part-time employed than men across the residential areas. At the same time, non-metro areas and the metro central cities always have*

**Table 4.3. Labor Force Participation Rates of U.S. Men and Women by Residence, 1996-2005 March CPS**

CPS Years	Labor force Status	<u>MEN</u>				<u>WOMEN</u>			
		Central city	Suburban	Non- metro	Unidentified	Central city	Suburban	Non-metro	Unidentified
1996	full-time	73.1	77.6	76.1	75.9	64.7	61.5	58.5	58.8
	unemployed	9.2	5.6	6.6	6.4	6.5	4.2	5.2	5.2
	involuntary part-time	3.8	3.4	3.5	3.1	3.4	3.4	5.7	4.2
	voluntary part-time	11.6	10.9	11.6	12.0	21.6	27.0	26.6	27.6
	not at work	2.3	2.6	2.2	2.5	3.8	4.0	4.1	4.2
1997	full-time	76.0	79.1	75.6	75.9	65.4	62.9	60.1	59.9
	unemployed	7.2	4.8	6.9	5.7	6.4	4.2	5.1	5.0
	involuntary part-time	3.2	2.5	2.5	3.1	3.2	3.4	4.3	4.1
	voluntary part-time	11.2	11.3	12.7	12.8	21.3	25.6	26.1	26.3
	not at work	2.5	2.2	2.4	2.5	3.7	3.9	4.4	4.7
1998	full-time	76.8	79.0	76.5	77.0	63.9	62.6	58.1	61.7
	unemployed	6.0	4.6	6.2	5.2	5.7	3.8	5.2	5.4
	involuntary part-time	3.1	2.5	2.6	3.6	3.2	2.6	4.7	3.4
	voluntary part-time	11.7	11.1	11.9	11.3	23.5	27.3	27.0	25.9
	not at work	2.4	2.7	2.7	2.9	3.6	3.7	5.0	3.5
1999	full-time	78.7	80.1	75.8	78.8	65.3	64.3	62.6	62.6
	unemployed	5.4	3.9	5.8	3.8	5.8	3.8	4.4	4.8
	involuntary part-time	2.8	2.3	3.5	3.0	3.5	2.5	3.0	3.3
	voluntary part-time	10.8	10.8	12.1	11.6	22.4	25.6	25.6	25.4
	not at work	2.4	2.9	2.9	2.9	3.0	3.9	4.5	4.0
2000	full-time	77.4	81.2	78.1	79.7	68.0	63.9	63.6	62.7
	unemployed	5.3	3.6	4.8	4.7	5.4	3.4	4.1	4.2
	involuntary part-time	2.7	1.8	2.4	1.8	2.5	2.0	3.0	2.8
	voluntary part-time	11.9	10.7	11.5	11.2	20.3	26.3	24.7	25.7
	not at work	2.8	2.7	3.2	2.6	3.9	4.5	4.6	4.6

Table continued on next page

**Table 4.3. Labor Force Participation Rates of U.S. Men and Women by Residence, 1996-2005 (Continued)**

CPS Years	Labor force status	<u>MEN</u>				<u>WOMEN</u>			
		Central city	Suburban	Non- metro	Unidentified	Central city	Suburban	Non- metro	Unidentified
2001	full-time	77.6	79.9	75.6	77.7	67.8	65.9	61.2	63.0
	unemployed	6.0	4.5	6.5	4.6	5.0	3.6	4.5	4.7
	involuntary part-time	2.6	2.0	3.1	2.5	2.2	2.2	4.0	2.1
	voluntary part-time	11.3	11.2	11.3	12.8	21.4	24.6	25.2	26.5
	not at work	2.6	2.5	3.5	2.4	3.6	3.8	5.1	3.8
2002	full-time	74.8	78.0	75.5	76.0	63.9	62.6	62.3	61.7
	unemployed	7.8	6.0	7.1	6.0	7.4	4.9	5.5	4.9
	involuntary part-time	3.4	2.8	4.0	3.5	3.5	2.7	4.0	2.1
	voluntary part-time	11.2	10.4	10.4	11.2	21.6	25.8	25.2	26.7
	not at work	2.7	2.9	3.0	3.3	3.7	4.1	3.0	3.6
2003	full-time	74.9	78.5	74.8	75.9	65.1	63.2	60.9	61.6
	unemployed	8.4	6.1	7.8	7.3	7.5	5.0	5.4	6.1
	involuntary part-time	3.7	2.8	4.1	2.7	3.6	3.0	4.3	3.7
	voluntary part-time	10.7	10.4	10.1	11.7	20.6	25.4	25.5	25.0
	not at work	2.4	2.3	3.2	2.4	3.2	3.5	3.9	3.6
2004	full-time	75.3	78.6	75.7	76.7	66.7	64.0	62.9	63.0
	unemployed	7.7	5.6	7.2	6.3	6.8	4.9	5.3	5.2
	involuntary part-time	3.8	3.0	3.8	2.8	3.9	2.8	4.6	3.0
	voluntary part-time	10.9	10.2	10.3	12.2	19.5	24.4	23.5	24.8
	not at work	2.4	2.6	3.0	2.1	3.1	3.9	3.7	4.1
2005	full-time	76.3	78.4	75.3	75.4	66.7	63.6	62.7	61.2
	unemployed	6.6	5.4	6.5	6.0	5.9	4.7	5.4	4.9
	involuntary part-time	3.8	2.9	3.5	3.4	3.4	3.0	3.7	3.8
	voluntary part-time	11.0	10.9	12.0	12.8	20.7	25.1	25.0	26.4
	not at work	2.4	2.5	2.7	2.5	3.3	3.6	3.2	3.7

Source: CPS Annual March Demographic Files(age 18 and above civilian labor force). Weighted data.

*higher involuntary part-time employment rates for both men and women as compared to suburban areas. Finally, the distribution of women's labor force participation generally shows higher percentages of women in involuntary part-time employment than men across all residential areas.*

#### **4.1.2. Characteristics of Involuntary and Voluntary Part-time Workers**

Tables 4.4 and 4.5 display the individual, and household-level demographic and regional characteristics of the full sample of pooled CPS March Demographic Files by residence, as well as the involuntary part-time and voluntary part-time samples of the CPS. Both tables are based on weighted samples of incoming (first year) rotations of cross-sectional pooled CPS data for 1996 through 2005 for the civilian, non-institutionalized, non-student population in the U.S. aged 18-64 years. Therefore, calculations and rates are slightly different than those in the Bureau of Labor Statistics tables.

Overall 58% of labor force participants reside in suburban areas, followed by 24% in central cities and 18% in non-metro areas. Descriptive statistics shows substantial differences in the socio-demographic characteristics of the labor force residing in central cities, suburban areas, and non-metro areas. Central city workers are less likely than both suburban and non-metro workers to be: white nonHispanic, self-employed and married with a working spouse. However they are more likely to be immigrants than both suburban and non-metro workers. Compared to central city and suburban workers, non-metro workers are more



**Table 4.4. Characteristics of the Working-age U.S. Labor Force From Pooled Incoming Rotations of the CPS, 1996-2005, Restricted Sample<sup>a</sup>**

	Central City %	Suburban %	Non-metro %
Residential status	24	58	18
Age			
18-25	15	13	13
25-34	27	22	22
35-44	27	30	28
45-54	21	24	24
55-64	10	11	12
Race/ethnicity			
White nonHispanic	53	77	85
Black nonHispanic	22	8	7
White Hispanic	16	10	5
Black Hispanic	1	0	0
Other	8	4	2
Educational attainment			
Less than high school	14	10	13
High school degree	29	31	41
Some college	27	29	28
College degree	19	21	12
Graduate degree	10	9	5
Marital status			
Married spouse working	46	60	60
Married spouse not working	13	12	13
Ever married	11	9	9
Never married	30	20	18
Own children			
Under 6 years	20	20	19
6 to 18 years	23	29	30
None of the above	58	51	52
Region			
Northeast	20	21	11
Midwest	20	23	33
South	30	35	43
West	30	21	14
Self-employed	9	10	13
Citizenship			
Native-born American	77	87	97
Foreign-born American	8	5	1
Non-citizen	15	7	3

Source: Incoming rotations of 1996-2005 CPS March Annual Demographic Files. Weighted data.

<sup>a</sup> Restrictions on the sample include civilian, non-institutionalized, non-student, aged 18 to 64.

**Table 4.5. Characteristics of Working-age Voluntary and Involuntary Part-time Labor Force Participants Based on Pooled CPS<sup>a</sup>**

	<u>Central city</u>		<u>Suburban</u>		<u>Non-metro</u>	
	<u>Voluntary</u>	<u>Involuntary</u>	<u>Voluntary</u>	<u>Involuntary</u>	<u>Voluntary</u>	<u>Involuntary</u>
	%	%	%	%	%	%
Age						
18-25	29	26	23	23	24	19
25-34	23	31	19	26	19	22
35-44	21	24	26	25	21	26
45-54	17	17	20	18	20	21
55-64	10	2	12	9	16	11
Race/ethnicity						
White nonHispanic	59	35	81	67	88	75
Black nonHispanic	17	24	7	9	6	10
White Hispanic	15	31	8	20	5	14
Black Hispanic	0	1	0	0	0	0
Other	9	9	4	4	2	1
Educational Attainment						
Less than high school	13	32	11	26	16	20
High school degree	25	34	27	35	40	42
Some college	34	21	36	24	30	28
College degree	18	11	18	11	10	7
Graduate degree	10	3	7	5	5	4
Marital status						
Married spouse working	44	35	55	40	55	46
Married spouse not working	10	9	10	13	12	11
Ever married	7	9	7	13	8	16
Never married	39	47	28	33	25	27
Own children						
Under 6 years	20	21	22	16	16	18
6 to 18 years	24	23	31	27	31	34
None of the above	56	56	47	57	52	48
Region						
Northeast	18	18	23	21	11	14
Midwest	20	20	24	20	35	22
South	29	25	31	30	39	48
West	33	37	22	30	16	15
Self-employed	10	15	12	12	15	21
Citizenship						
Native-born citizen	81	63	91	80	97	93
Foreign-born citizen	6	10	4	5	1	1
Foreign	13	27	5	15	2	6

Source: Incoming rotations of 1996-2005 CPS March Annual Demographic Files. Weighted data.

<sup>a</sup> Restrictions on the sample include civilian, non-institutionalized, non-student, aged 18 to 64.

likely to be: white nonHispanic, self-employed, native-born American and to have a high school degree.

The characteristics of voluntary and involuntary part-time labor by residential areas are shown in Table 4.5. The rates of voluntary part-time employment are somewhat higher at younger ages (under 25) and higher at older ages (over 55) than the rates of involuntary part-time workers across residential areas. Further, the age structure of involuntary workers appears to be weighted toward younger working ages than older working ages.

There are striking differences between the race/ethnicity characteristics of voluntary and involuntary workers when compared among the central cities, suburban and non-metro areas. Although voluntary and involuntary workers within all residential areas are much more likely to be white nonHispanic, the percentages of white nonHispanic *voluntary* part-time workers are higher than white nonHispanic *involuntary* part-time workers in all areas. *Compared to voluntary part-time workers, involuntary part-time workers are more likely to be black nonHispanic, white Hispanic and black Hispanic in all three residential areas.* As anticipated, non-metro areas are comprised of proportionately greater white nonHispanic voluntary and involuntary part-time workers than other residential areas, given the much greater concentration of white nonHispanic workers there. Both voluntary and involuntary part-time workers are more likely to be black and Hispanic in the central cities than in suburban and non-metro areas. Among involuntary part-time workers, more non-white individuals are employed in the central cities, while white nonHispanic workers

account for a greater percentage of the workforce in the suburban and non-metro areas. About 75% of involuntary part-time workers who live in non-metro areas are white nonHispanic compared to 35% in the central cities and 67% in suburban areas.

There are noteworthy differences between voluntary and involuntary part-time workers according to educational attainment. *Involuntary part-time workers have lower educational attainment than their voluntary part-time counterparts.* While involuntary part-time workers are more likely to be high school graduates, voluntary part-time workers are more likely to be college graduates. Suburban areas have relatively higher educational attainment for both voluntary and involuntary part-time workers; *42% of non-metro involuntary part-time workers are only high school graduates* -- higher than in the central city and suburban areas (Table 4.5). Evidence shows that in the central cities, those working on an involuntary part-time basis appear more likely to include individuals who have not finished high school, than in non-metro areas. In non-metro areas, involuntary part-time employment is more concentrated among those finishing high school.

*Involuntary part-time employees in all three residential areas are less likely to be married with a working spouse than their voluntary part-time counterparts.* It is anticipated that this is the case because, voluntary part-time jobs are chosen by those who have other responsibilities (e.g., household-related responsibilities). Among involuntary part-time workers, those who live in non-metro areas are more likely to be married and the central cities have higher percentages of those who have never been married. Non-metro areas have both more married voluntary and involuntary

part-time workers than the central cities and suburban areas. Unlike voluntary part-time workers, involuntary part-time workers are more likely to be single (never married) in all residential areas. Furthermore, involuntary part-time workers are less likely to have children present in the household than voluntary part-time workers especially in suburban and non-metro areas. Involuntary part-time workers are more likely to be self-employed in central cities and non-metro areas than voluntary part-time workers.

The central cities and suburban areas of the western states have higher involuntary part-time rates than any other regions within the U.S., and among non-metro areas, the southern states have the highest involuntary part-time employment rates. Voluntary part-time work participation is higher in the Midwest states than involuntary part-time participation.

Foreign-born citizen and non-citizen workers are more likely to be involuntary part-time workers than native-born citizens in all residential areas. However, this rate is much higher in the central cities and suburban areas than in the non-metro areas, mainly because non-metro areas have higher proportions of native-born citizens.

The descriptive analyses show that there are basic differences between voluntary and involuntary part-time labor in terms of age, education, race/ethnicity, marital status and other socioeconomic and demographic characteristics. In the central cities, involuntary part-time workers are younger, racially and ethnically more diverse, have lower educational attainment, are less likely to have been married and less likely to have children than voluntary part-time workers. Overall, involuntary

part-time workers are socio-economically disadvantaged compared to voluntary part-time workers.

#### **4.1.3. Characteristics of Involuntary Part-time Workers**

Finally, Table 4.6 summarizes the characteristics of involuntary part-time labor by gender across residential areas. Involuntary part-time workers residing in central city and suburban areas are more likely to be men while those in non-metro areas are more likely to be women. In all residential areas for both men and women (except for suburban women), involuntary part-time employment occurs at younger ages (below 45). The prevalence of involuntary part-time employment at older ages is higher in non-metro areas than in the central cities and suburban areas for both genders.

The race/ethnicity profile especially differs in the central cities between men and women. Black nonHispanic women are more likely to be among the involuntarily part-time employed than black nonHispanic men, whereas white Hispanic men are more likely to be involuntarily part-time employed than white Hispanic women in the central cities. The percentage of nonHispanic black women who work part-time involuntarily is higher than the percentage of nonHispanic black men who work part-time involuntarily, in all residential areas. Again, non-metro areas, followed by

**Table 4.6. Characteristics of Involuntary Part-time Labor by Gender, 1996-2005<sup>a</sup>**

	<b>Central City</b>		<b>Suburban</b>		<b>Non-metro</b>	
	<b>Men (55%)</b>	<b>Women (45%)</b>	<b>Men (55%)</b>	<b>Women (45%)</b>	<b>Men (49%)</b>	<b>Women (51%)</b>
	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>
Age						
18-25	21	32	25	20	23	15
25-34	36	26	30	21	22	23
35-44	25	24	24	26	24	28
45-54	15	19	12	25	18	24
55-64	4	0	9	8	13	9
Race/ethnicity						
White nonHispanic	31	40	66	69	80	71
Black nonHispanic	23	26	11	7	7	13
White Hispanic	32	29	20	20	12	15
Black Hispanic	3	0	0	0	0	0
Other	12	5	4	4	0	2
Educational attainment						
Less than high school	39	22	32	19	18	21
High school degree	33	35	32	37	46	38
Some college	13	29	21	27	23	33
College degree	11	11	9	12	8	6
Graduate degree	3	3	5	5	5	2
Marital status						
Married spouse working	34	36	39	42	42	50
Married spouse not working	10	9	13	13	10	13
Ever married	6	13	9	20	10	21
Never married	50	42	39	25	38	16
Own children						
Under 6 years	19	23	18	12	54	43
6 to 18 years	19	29	20	36	18	18
None of the above	62	49	62	52	29	39
Region						
Northeast	18	18	17	25	20	9
Midwest	16	25	18	21	26	19
South	26	25	34	25	41	55
West	41	31	30	28	13	18
Self-employed	20	10	17	6	33	10
Citizenship						
Native-born citizen	61	64	80	81	92	93
Foreign-born citizen	11	9	4	6	1	1
Non-citizen	28	26	16	13	6	6

Source: Incoming rotations of 1996-2005 CPS March Annual Demographic Files. Weighted data.

<sup>a</sup> Restrictions on the sample include civilian, non-institutionalized, non-student, aged 18 to 64.

suburban areas, have more white nonHispanic involuntary part-time workers of both genders.

Women who work involuntarily part-time are generally more educated than their male counterparts. Among those who are employed part-time involuntarily (in all residential areas), a greater percentage of men have less than a high school education or (only) a high school degree than women who have attended some college.

Although there is not much difference between the married men and women involuntary part-time worker rates, rates of ever-married and never-married men and women are significantly different in all areas. Ever-married women are more likely to be involuntarily part-time employed than ever-married men, whereas never-married men are more likely than women to become involuntary part-time workers. Non-metro areas have the highest married population.

Unlike women who work part-time voluntarily, women with small children appear not as likely to become involuntary part-time employees as women with older children. Again, women with younger children are more likely to choose voluntary part-time employment over involuntary part-time employment. However, women with no children present are less likely to become involuntary part-time workers than men with no children present.

In the Northeast and South regions, rates of involuntary part-time employment are higher for men whereas for women, rates are highest in the West. In the West, involuntary part-time employment of both men and women is more common in the



central cities and in the Midwest and South this form of employment is more common in non-metro areas.

## **CHAPTER 5**

### **RESULTS**

#### **5.1. Results of the Static Models: Identifying the Determinants of Involuntary Part-time Employment**

A set of multinomial probit models (MNP) of labor force participation is estimated and presented first. These models are estimated using a ten percent sample of pooled (1996-2004) incoming rotations (rotations 1-4) of the March CPS data for U.S. civilians aged 18-64 years. Estimated are one overall model for the full sample, two overall models for male and female samples and one model for each of three residential categories: central city, non-metro and suburban. All models are estimated using the STATA 9 multinomial probit option. The default baseline category in STATA 9 is the full-time work choice that includes the most observations of any of the relevant choice categories. The baseline category (full-time labor force status) is also the category most relevant as a reference category. The sequence of choice set in the model is unemployed, involuntary part-time employed, voluntary part-time employed and not at work.

Table 5.1 presents the multinomial probit estimations for the overall sample without any distinction between genders and among residential status categories. The marginal effects and standard errors are reported in the table. Marginal effects are partial derivatives of the probability with respect to

**Table 5.1. MNP Estimates of Characteristics of Labor Force Status for U.S. Workers, 1996 to 2004 March CPS**

Variables	<u>Unemployed</u>		<u>Involuntary part-time</u>		<u>Voluntary part-time</u>		<u>Not at Work</u>	
	Marginal Effect	Standard Error	Marginal Effect	Standard Error	Marginal Effect	Standard Error	Marginal Effect	Standard Error
Age	-0.0030***	0.001	-0.0005***	0.001	-0.0313***	0.002	-0.0031***	0.001
Age squared	0.0000***	0.000	0.0000***	0.000	0.0004***	0.000	0.0000***	0.000
Suburban	-0.0051	0.003	0.0021	0.003	0.0051	0.006	0.0006	0.003
Non-metro	0.0003	0.004	0.0112***	0.004	-0.0032	0.008	0.0054	0.004
Unidentified	0.0090**	0.005	0.0046*	0.003	0.0020	0.007	0.0043	0.004
Midwest	0.0041	0.004	0.0018	0.003	-0.0075	0.007	-0.0011	0.003
South	-0.0042**	0.004	-0.0046**	0.003	-0.0197***	0.007	-0.0064***	0.003
West	0.0033	0.004	-0.0021	0.003	-0.0035	0.007	-0.0068*	0.003
Child aged 6 to 18	-0.0026	0.004	0.0043	0.004	0.0252***	0.008	-0.0093*	0.004
No child present	-0.0059**	0.005	0.0050	0.003	-0.0353***	0.009	-0.0046*	0.004
Spouse employed	-0.0133**	0.004	-0.0023	0.003	0.0196**	0.008	0.0009	0.004
Ever married	0.0173**	0.007	0.0142***	0.005	-0.0204	0.010	-0.0066	0.005
Never married	0.0240***	0.007	0.0139***	0.005	0.0570***	0.011	-0.0025	0.005
Female	-0.0059***	0.003	0.0043***	0.002	0.1573***	0.005	0.0214***	0.002
High school graduate	-0.0225***	0.003	-0.0133***	0.002	-0.0453***	0.008	-0.0138***	0.004
Some college	-0.0334***	0.003	-0.0185***	0.002	-0.0078***	0.008	-0.0074***	0.004
College graduate	-0.0387***	0.003	-0.0220***	0.002	-0.0404***	0.008	-0.0137***	0.004
Graduate	-0.0409***	0.002	-0.0200***	0.002	-0.0379***	0.010	-0.0041***	0.005
Black nonHispanic	0.0329***	0.006	0.0044	0.004	-0.0487***	0.008	-0.0009	0.004
White Hispanic	0.0078	0.005	0.0085*	0.004	-0.0316***	0.008	-0.0038	0.004
Black Hispanic	0.0192	0.022	0.0014	0.016	-0.0708*	0.028	-0.0141	0.014
Others	0.0121	0.008	-0.0037	0.004	-0.0085	0.012	0.0027	0.006
Foreign-born citizen	-0.0137**	0.005	0.0057	0.005	-0.0343***	0.011	-0.0027	0.005
Foreign worker	-0.0071*	0.005	0.0115**	0.005	-0.0309***	0.009	-0.0055	0.004
Self-employed	-0.0250***	0.004	0.0211***	0.004	0.0695	0.009	0.0334***	0.005
Time	-0.0002	0.001	-0.0007**	0.000	-0.0006	0.001	-0.0007*	0.000
Gross state product	-0.0691	0.000	0.0058	0.000	0.1340	0.000	0.0124	0.000
Metro/non-metro unemployment rate	0.0085***	0.001	0.0021***	0.001	-0.0021	0.002	0.0012*	0.001

Pseudo log likelihood = -49426557, N = 33087

Significant at  $p < 0.10$ , \*\* Significant at  $p < 0.05$ , \*\*\* Significant at  $p < 0.01$

Reference group is: central city, Northeast region, male, children under age 6 present, less than high school education, married, white nonHispanic, and native-born citizens.

independent variables and are more relevant for interpretation than the estimated coefficients for the MNP. The first column of Table 5.1 reports the marginal effects of individual demographic, geographic, and economic variables on unemployed individuals relative to full-time employed individuals. The other columns present the same effects for involuntary part-time workers, voluntary part-time workers and those who are not at work, respectively. Different significance levels of the estimated marginal effects are reported with asterisks next to marginal effects with \*\*\* being significant at the 0.01 level, \*\* being significant at the 0.05 level and \* significant at the 0.1 level. Although the tables report the results for the full choice set, the discussion focuses on the factors influencing the likelihood of being an involuntary part-time worker versus a full-time worker.

The results in Table 5.1 indicate those factors affecting the likelihood of being in five different labor states (measured relative to full-time employment status). These factors are shown to differ greatly. Age has a statistically significant negative effect on participation in part-time work (either voluntary or involuntary) while the age squared variable has a (statistically) significant positive effect. This shows that the age function is upward concave and the minimum of the function for each labor state gives us the lowest probability of participating in that state, in this case participating in part-time work. All other aspects being equal, 39 year olds have the lowest probability of becoming involuntary part-time

workers.<sup>40</sup> Both younger and older workers have higher rates of part-time employment than those in their forties. This represents a life-cycle effect.

Living in a non-metro area has a positive effect on involuntary part-time labor status and increases the probability of being an involuntary part-time worker 1.1 % more than living in the central cities. This effect is statistically significant indicating that non-metro residence does make a difference in the likelihood of involuntary part-time employment. However, residential status of any other form does not have a significant effect on any other labor market status.

Women are 0.4 percent more likely to become involuntary part-time workers than men. This is consistent with the descriptive statistics in Chapter 4 but not consistent with the previous literature that looked at the data prior to 1994 or data limited to a one-year period (Stratton 1996; Wenger 2001). A possible explanation for this result is that men have more stable labor market experiences than women. Women are often the ones who take time off or reduce their working hours due to other obligations. Returning to the labor market might not be as successful as expected. Thus, women might have to settle for part-time jobs until full-time jobs become available. Changing labor market conditions in time may be the reason for this occurrence. Involuntary part-time work was often viewed as a manufacturing sector phenomenon, affecting many males who suffered from slack work conditions. This is not the case anymore. Compared to those who are

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<sup>40</sup> The ages with lowest probabilities are calculated by setting the first derivatives (marginals) of the age and age squared equal to zero and solving it for age. For involuntary part-time workers we set first derivatives of  $-0.0004745 + 0.00061 \text{ age}^2$  equal '0'. As follows;  $0.0004745 / 2(0.00061) \text{ age}=0$ , solving this equation yields  $\text{age}=39$ .

currently married (spouse not working), those who were previously married but currently single and those who were never married are more likely to become involuntary part-time workers, whereas similar individuals are less likely to become voluntary part-time workers. As expected, having school-age children present in the household increases the likelihood of voluntary part-time employment relative to having young children less than 6 years old present. However, having older children present or not having any children present at home, compared to having younger children under 6 years old, does not have any statistically significant effect on involuntary part-time employment. This shows the importance of children in the decision to work part-time voluntarily.

Education has a similar influence on participation in both voluntary and involuntary part-time jobs; the higher the educational attainment, the lower the probabilities of working part-time either voluntarily or involuntarily. This effect is strong across the labor force status.

Non-citizen workers are more likely to become involuntary part-time workers (relative to full-time workers) than native citizens. Non-citizen workers usually work either at low-end jobs or high-end jobs. In either case they have more incentive to work full-time instead of part-time. A higher likelihood of being in involuntary part-time jobs suggests the presence of a citizenship advantage.

As expected, compared to white nonHispanic individuals, workers of other races/ethnicities are less likely to be employed in voluntary part-time jobs.

However, we were not able to detect a statistically significant effect of race/ethnicity on involuntary part-time employment in the overall model. It was expected that racial and ethnic differences play a significant role in holding involuntary part-time work status, but this needs further investigation. As mentioned in the methodology chapter, the double disadvantage and underemployment research suggest that workers who are non-white are more likely to become underemployed than white nonHispanic workers (DeJong 2001).

A higher metro/non-metro unemployment rate increases the probability of involuntary part-time employment. This effect is also statistically significant indicating strong association between unemployment rate and involuntary part-time employment. Since more explanatory variables have common signs and statistical significance between the unemployment and involuntary part-time employment labor states than between involuntary and voluntary part-time employment, the evidence suggests that involuntary part-time employment is more similar characteristically to unemployment than to voluntary part-time employment. This result emphasizes the importance of variations in labor demand conditions.

### **5.1.1. Identifying Determinants of Women's and Men's Labor Market Choices**

Table 5.2 reports the multinomial probit estimation results for women's and men's involuntary part-time labor market choices. Columns are extracted

**Table 5.2 MNP estimates of Characteristics of Involuntary Labor Force Status of U.S. Women and Men, 1996 to 2004 March CPS**

Variables	WOMEN*		MEN*	
	Marginal Effect	Standard Error	Marginal Effect	Standard Error
Age	-0.0007***	0.001	-0.0006***	0.001
Age squared	0.0000***	0.000	0.0000***	0.000
Suburban	0.0018	0.004	0.0018	0.003
Non-metro	0.0094**	0.006	0.0114**	0.005
Unidentified	0.0020	0.004	0.0067**	0.004
Midwest	-0.0014	0.004	-0.0020	0.004
South	-0.0063***	0.004	-0.0032	0.003
West	-0.0000	0.004	0.0039	0.004
Child aged 6 to 18	0.0065	0.005	0.0011	0.004
No child present	0.0048	0.005	0.0032	0.004
Spouse employed	-0.0031	0.005	-0.0023	0.004
Ever married	0.0143	0.007	0.0099**	0.008
Never married	0.0041	0.006	0.0196***	0.007
High school graduate	-0.0112***	0.004	-0.0136***	0.003
Some college	-0.0155***	0.004	-0.0193***	0.003
College graduate	-0.0208***	0.003	-0.0211***	0.002
Graduate	-0.0197***	0.003	-0.0183***	0.002
Black nonHispanic	0.0020	0.005	0.0086**	0.006
White Hispanic	0.0169**	0.006	0.0024	0.004
Black Hispanic	-0.0225***	0.003	0.0276	0.031
Others	-0.0096*	0.005	0.0014	0.006
Foreign-born citizen	0.0092	0.008	0.0032	0.006
Foreign worker	0.0186**	0.007	0.0064	0.005
Self-employed	0.0053***	0.006	0.0294***	0.006
Time	-0.0002	0.001	-0.0011**	0.001
Gross state product	-0.112**	0.000	0.1020***	0.000
Metro/non-metro unemployment rate	0.0051***	0.001	-0.0007	0.001

\* MNP estimates for men and women are separately provided in the appendix.



from tables in appendix (A.4 and A.5) to be able to compare factors affecting men's and women's involuntary part-time labor force status. Age, residing in South, education and the unemployment rate are the most statistically significant ( $\alpha = 0.01$ ) determinants of women's involuntary part-time work status. Both men and women living in non-metro areas are more likely to be employed involuntarily on a part-time basis but want to work full-time than women living in the central cities. That is, the marginal effect of the non-metro variable for involuntary part-time employment is positive, showing that female and male workers who live in non-metro areas are more likely to be involuntary part-time workers than men and women in the central cities. There is also evidence of racial/ethnic differences that we were not able to detect in previous models. White Hispanic women are more likely to become involuntary part-time workers whereas black Hispanic women are less likely to become involuntary part-time workers than white nonHispanic women.

The labor choices of men, however, exhibit different patterns. The second column of Table 5.2. reports the multinomial probit estimates of men's involuntary part-time labor force status. The age, education and residing in non-metro areas have similar influence on men and women. Additionally, marital status is a significant determinant of men's involuntary labor force status. Married men generally have a more stable job status, therefore as compared to a married male, being single (ever married or never married) increases the likelihood of a male being an involuntary part-time worker. As expected, the higher the

educational attainment among men, the lower the probability of employment in involuntary part-time jobs. Race/ethnicity does have a different effect on the involuntary part-time work status of men; black nonHispanic men are less likely to be working on an involuntary part-time basis than white nonHispanic men.

Overall male and female involuntary part-time workers have many similar characteristics but different levels of association among those characteristics. That also explains the racial/ethnic influences of involuntary part-time employment that we were not able to detect significantly in the full model but were able to detect in gender segregated models.

### **5.1.2. Identifying Determinants of Involuntary Part-time Employment by Residential Status**

Previous literature suggests that voluntary and involuntary part-time working men and women are affected by different characteristics in different residential settlements. Table 5.3 reports partial results from residential models for central city, suburban, and non-metro areas. Appendix tables A.6 through A.8 present the full results of multinomial probit estimates of the central city, suburban areas and non-metro areas separately. The estimated residential models include coefficients (marginal effects) that are found to explain the individual's current labor market status. The education, age, and gender variables explain current involuntary part-time status in all residential categories: central city, suburban and non-metro.

**Table 5.3 MNP Estimates of Characteristics of Involuntary Part-time Labor Force Status of Men and Women Living in U.S. Central Cities, Non-Metro Areas and Suburban Areas**

Variables	Central City		Non-Metro Areas		Suburban Areas	
	Marginal Effect	Standard Error	Marginal Effect	Standard Error	Marginal Effect	Standard Error
Age	-0.0021**	0.001	-0.0008***	0.001	-0.0004***	0.001
Age squared	0.0000	0.000	0.0000***	0.000	0.0000***	0.000
Midwest	0.0078	0.007	-0.0191**	0.007	-0.0004	0.003
South	0.0010	0.006	-0.0110	0.008	-0.0046**	0.003
West	0.0091*	0.006	-0.0101	0.008	0.0016	0.004
Child aged 6 to 18	0.0148**	0.008	0.0016	0.009	0.0007	0.004
No child	0.0122	0.006	-0.0077	0.009	0.0051	0.004
Female	0.0033***	0.004	0.0123***	0.005	0.0026***	0.002
Spouse employed	0.0061	0.006	-0.0018	0.008	-0.0055**	0.004
Ever married	0.0109	0.010	0.0280**	0.015	0.0124***	0.007
Never married	0.0204***	0.009	0.0339***	0.016	0.0074***	0.006
High school	-0.0103***	0.004	-0.0064*	0.008	-0.0153***	0.003
Some college	-0.0184***	0.004	-0.0073*	0.008	-0.0208***	0.003
College	-0.0200***	0.004	-0.0184***	0.006	-0.0229***	0.002
Graduate	-0.0212***	0.003	-0.0132*	0.009	-0.0192***	0.002
Black	0.0087	0.006	0.0073	0.011	0.0010	0.005
Hispanic	0.0098	0.006	0.0468***	0.022	0.0024	0.004
Others	0.0028	0.008	-0.0170	0.009	-0.0065	0.005
Foreign born citizen	0.0167	0.010	-0.0044	0.016	0.0022	0.006
Foreign worker	0.0137*	0.007	0.0031	0.016	0.0107	0.006
Self-employed	0.0401***	0.012	0.0407***	0.012	0.0088***	0.005
Time	-0.0006	0.001	0.0017*	0.001	-0.0015***	0.000
Gross state product	0.0629	0.000	0.0241	0.000	0.0049	0.000
Metro/non-metro unemployment rate	0.0025	0.002	0.0002	0.002	0.0034***	0.001

\* MNP estimates for men and women living in central cities, non-metro areas and suburban areas are separately provided in the appendix.

Similar to the previous tables, involuntary part-time workers are more likely to be single (ever married or never married) than married with a stay-at-home spouse in all three residential areas. Women are also more likely to become involuntary part-time workers than men in all residential areas. Another common significant explanatory variable across residential areas is education. More educated workers are less likely to become involuntary part-time employees. In the central cities, in addition to gender and education, citizenship and having school age children present at home, influence the likelihood of involuntary part-time work. The unemployment rate and involuntary part-time employment are directly related in suburban areas and in the central cities. This effect does not appear to be statistically significant in U.S. non-metro areas.

Non-metro areas also have different variables affecting involuntary part-time status than do the central cities and suburban areas. Although education has similar effects in all three residential areas, this effect is not as strong in non-metro areas. Hispanics living in non-metro areas are more likely to become involuntary part-time workers compared to white nonHispanics living in non-metro areas. One of the advantages of these models that are based on residential desegregation is that regional effects are statistically more significant. Suburban areas of the South compared to suburban areas of the Northeast have lower probabilities of having involuntary part-time workers. The same is true for non-metro areas of the Midwest.

The multinomial probit models reported above have compared the effects of a set of variables on involuntary part-time employment relative to full-time employment. Consistent with descriptive Table 4.5, involuntary part-time employees are more likely to be single (never married) or currently not married (ever married), black nonHispanic or white Hispanic than white nonHispanic, and more likely to be a non-citizen worker than native-born. Women are less likely to become involuntary part-time workers than men. As expected, some college and higher educational attainment reduces the probability of being an involuntary part-time employee. The unemployment rate has a significant effect on being an involuntary part-time worker. The higher the unemployment rate, the higher the likelihood of involuntary part-time employment. Descriptive and statistical analyses provide evidence that there are significant differences between those factors affecting voluntary and involuntary part-time employment.

## **5.2. Descriptive Inflow-Outflow Analysis of Involuntary Part-time Employment Dynamics**

The first section of results aimed to define those factors that influence the likelihood that a worker is part of the involuntary part-time labor force in the U.S. in a more comprehensive framework and to provide evidence of similarities and differences between factors influencing that likelihood. Building on this work, transition dynamics are examined, focusing on transitions between alternative labor states. A set of binomial and multinomial probit models are estimated using

matched and pooled March Current Population Survey (CPS) data; descriptive tables are also provided. The transition analyses are based on March CPS data between 1996 and 2004 for civilian, non-institutionalized, and non-student labor between 18 and 64 years of age (i.e., the working-age population). Different from the static models, the 'not in labor' force category is included in the transition models since a significant number of transitions occur between involuntary part-time labor and not being in the labor force. As a separate category, transition between self-employment and involuntary part-time employment is also considered.

Patterns of transition between time 1 and time 2 are first studied. For workers in a given state at time  $t$ , the fraction remaining in the same state versus those that transition to another state is determined. These transitions are examined separately for men and women and for three residential statuses. Tables 5.4 and 5.5 show transitions into (in-flow) and out of (out-flow) involuntary and voluntary part-time employment in the U.S., using the matched and pooled CPS data. For each involuntary or voluntary part-time worker at year  $t$ , possible outcomes at year  $t+1$  include full-time employment, unemployment, voluntary part-time employment, involuntary part-time employment, not at work and not in the labor force. Similarly, for each involuntary or voluntary part-time worker at year  $t+1$ , year  $t$  status of the same worker includes full-time employment, unemployment, voluntary part-time employment, involuntary part-time employment, not at work and not in the labor force. As shown in Table 5.4, in-flow and out-flow rates of

**Table 5.4. In-flow and Out-flow Rates of Involuntary Part-time Workers, 1996-2004 CPS**

Into involuntary employment from:	Involuntary %
Full-time	41
Unemployed	9
Involuntary part-time	15
Voluntary part-time	20
Not at work	4
Not in labor force	10
Out of Involuntary part-time employment	
Full-time	48
Unemployed	7
Involuntary part-time	15
Voluntary part-time	20
Not at work	3
Not in labor force	9

Source: Matched and pooled March CPS Annual Demographic Files 1996-2004. Weighted data.

**Table 5.5. In-flow and Out-flow Rates of Involuntary Part-time Men and Women, 1996-2004 CPS**

Into involuntary from:	<u>Involuntary %</u>	
	<u>Male</u>	<u>Female</u>
Full-time	48	33
Unemployed	10	9
Involuntary part-time	13	16
Voluntary part-time	17	24
Not at work	4	4
Not in labor force	7	14
Out of involuntary into:		
Full-time	53	41
Unemployed	8	6
Involuntary part-time	13	17
Voluntary part-time	16	23
Not at work	3	3
Not in labor force	8	12

Source: Matched and pooled March CPS Annual Demographic Files 1996-2004. Weighted data.

involuntary part-time workers show that the most frequent movement occurs with full-time employment. Table 5.5 reports the same rates for men and women separately. For both men and women, the fraction that remains in involuntary part-time employment from one year to another is much lower than the fraction that moved into full-time employment. While the percentage of men moving between full-time hours and involuntary part-time hours is much higher than for women, the percentage of women moving into and out of the labor force is higher than men. The evidence from table 5.5 supports the concept that involuntary part-time employment is likely temporary, transitional and shorter in duration.

Table 5.6 repeats the out-flow transition for those who are also self-employed. In this table, full-time, voluntary part-time and involuntary part-time labor force status is further categorized into wage and salary employment and self-employment. Fifteen percent of involuntary part-time workers choose to move into self-employment (8% full-time, 4% voluntary part-time and 3% involuntary part-time). This suggests that when the economy is unable to provide longer hours of wage and salary jobs, there are also self-employment opportunities that provide greater flexibility to increase hours rather than waiting in the involuntary part-time state or leaving the workforce.



**Table 5.6 Detailed Out-flow Rates of Involuntary Part-time Workers Including Self-employment, 1996-2004 CPS**

Out of involuntary employment from:	Involuntary %
Full-time	
Full-time wage and salary	40
Full-time self-employed	8
Unemployed	7
Involuntary part-time	
Involuntary part-time wage and salary	12
Involuntary part-time self-employed	3
Voluntary part-time	
Voluntary part-time wage and salary	15
Voluntary part-time self-employed	4
Not at work	3
Not in labor force	9

Source: Matched and pooled March CPS Annual Demographic Files 1996-2004. Weighted data.

Tables 5.7 and 5.8 present in-flow and out-flow transition rates for men and women in the U.S. by residence. These statistics are also calculated using the weighted CPS matched samples. Table 5.7 shows that the transition rates into involuntary part-time employment differ slightly for men and women by residential status. For both men and women in every residential area, transition from full-time employment into involuntary part-time employment is higher than in any other state. Female involuntary part-time workers in suburban areas are slightly more likely than those in non-metro locations to have been employed in full-time jobs, while male involuntary part-time workers in non-metro areas are slightly more likely than those in suburban locations to have been employed in full-time jobs. On average, about 48% of male involuntary part-time workers transitioned from full-time employment in all areas, while about 33% of female involuntary part-time workers were employed full-time in the previous time period (see Table 5.5).

The out-flow transition table (Table 5.8) shows a high out-flow rate to jobs with full-time hours. It should be noted that this is a transition in terms of number of hours working. Change of hours might be due either to a job change from part-time to full-time work or due to a part-time job becoming a full-time job in  $t+1$  (e.g., when the economy improves). Transition rates among men and among

**Table 5.7. In-flow Transitions for Involuntary Part-time Workers by Residential Status<sup>a</sup>**

Labor force status at year t	<u>Male</u>			<u>Female</u>		
	Central city	Suburban	Non-metro	Central city	Suburban	Non-metro
Full-time	47	48	49	30	34	33
Unemployed	10	11	6	8	10	7
Involuntary part-time	13	13	16	18	14	20
Voluntary part-time	18	16	18	22	26	20
Not at work	5	4	5	4	4	3
Not in labor force	7	8	7	18	12	16

Source: Matched and pooled March CPS Annual Demographic Files 1996-2004. Weighted data

<sup>a</sup> Involuntary part-time worker at time t+1

**Table 5.8. Out-flow Transitions of Involuntary Part-time Workers <sup>a</sup>**

Labor force status at year t+1	<u>Male</u>			<u>Female</u>		
	Central city	Suburban	Non-metro	Central city	Suburban	Non-metro
Full-time	51	53	53	42	41	38
Unemployed	8	7	9	6	6	5
Involuntary part-time	12	13	14	17	15	19
Voluntary part-time	13	18	16	17	27	22
Not at work	3	3	3	4	2	3
Not in labor force	12	6	5	14	9	13

Source: Matched and pooled March CPS Annual Demographic Files 1996-2004. Weighted data.

<sup>a</sup> Involuntary part-time worker at time t

women are pretty similar in all three residential areas differing by only a few percentage points, with the exception that transition into fulltime jobs in non-metro areas for female workers is much lower. That is also consistent with the underemployment and labor market transition literature that emphasizes the non-metro disadvantage (Jensen et al. 1999, Vera-Toscano et al. 2004). As previously suggested, rural labor markets have more severe barriers to work than urban labor markets, including small settlement and density patterns (i.e., greater distances to work and a less developed transportation network), lower welfare and government support (Jensen and Lichter 2000), and lack of child care support (Weber, Duncan and Whitener 2001), to name a few. A greater percentage remains as involuntary part-time workers in non-metro areas than in central city and suburban areas. This suggests that involuntary part-time workers in non-metro areas are more disadvantaged than their suburban and central city counterparts -- who are more likely to transition out of involuntary part-time work. As expected, a greater proportion of men over women move into full-time jobs in all residential areas while a greater proportion of women over men move into voluntary part-time jobs in all residential areas.

The in-flow and out-flow transition tables show that transitions are most likely to occur between involuntary part-time work and full-time employment. In some cases this can result from employer reductions in work hours to adjust to downturns in the economy. In other cases, workers change jobs, using involuntary part-time work as a temporary or transitional stage. There is also evidence of

gender differences in transition out of involuntary part-time work: women are less likely than men to move into full-time jobs but more likely to move into voluntary part-time jobs, indicating that women's and men's labor market decisions are based on different dynamics. Also evidence of transitions between self-employment and involuntary part-time jobs indicates that individuals look for alternative job arrangements when full-time wage and salary jobs that match their expectations are not available. Finally, there is some evidence of a rural disadvantage for women workers; the outflow transition rates from involuntary part-time jobs to full-time employment are lower in non-metro areas than in the central cities or suburban areas of the U.S.

### **5.3. Models of Involuntary Part-time Transitions**

Main focus of this dissertation is on the multivariate analysis of the factors associated with transitions into and out of involuntary part-time employment, particularly the transition between full-time employment and involuntary part-time employment. The effects of potentially important factors on transitions into and out of involuntary part-time labor status are estimated using binomial and multinomial probit models. The following models are estimated 1) binomial probit models for transitions *into* involuntary part-time jobs at year t+1 from each of (a) full-time work, (b) unemployment, (c) involuntary part-time work, (d) voluntary part-time work, (e) not at work and (f) not in the labor force in year t, and 2) multinomial probit models for transitions *from* involuntary part-time jobs at year t into full-time work, unemployment, voluntary part-time work,

involuntary part-time work, not at work or not in the labor force in year  $t+1$ . The specific focus in each set of models is on transition between full-time employment and involuntary part-time employment. The ‘not in the labor force’ category is included in all models in this section and the metro/non-metro unemployment rate and real state gross product variables are incorporated as change variables. A separate model is estimated including self-employment as a subcategory of full-time employment, voluntary part-time employment and involuntary part-time employment.

### **5.3.1. Transitions into Involuntary Part-time Jobs**

Binomial probit models are estimated to identify those factors that influence transitions into involuntary part-time jobs. As previously mentioned, the sample is necessarily restricted for each model. The dependent variable in each estimated model is a dichotomous dependent variable that takes a value of 1 if the employee transitions into an involuntary part-time job at year  $t+1$ . If not, the variable takes a value of 0, indicating that a transition to involuntary part-time work has not taken place. Table 5.9 reports the marginal effects and standard errors of five separate probit estimations. Independent variables are drawn for year  $t$ , except for the change variables.

Results from the set of binomial models reported in table 5.9 shows that there are not many statistically significant relationships between demographic characteristics and transition into involuntary part-time employment. Living in non-metro areas increases the likelihood of moving into involuntary part-time

**Table 5.9 Marginal Effects from Binomial Probit Estimates of Transitions Into Involuntary Part-time Status in the U.S. , 1996-2004 CPS**

Variables	Full-time (N=13488)		Unemployed (N=757)		Voluntary Part-time (N=2783)		Not in labor force (N=4069)		Not at work (N=614)	
	Marginal Effects	Standard Error	Marginal Effects	Standard Error	Marginal Effects	Standard Error	Marginal Effects	Standard Error	Marginal Effects	Standard Error
Age	0.0002	0.001	0.00168	0.005	0.00009	0.002	0.00086	0.001	-0.00207	0.004
Age squared	-0.0000	0.000	-0.00002	0.000	-0.00000	0.000	-0.00001**	0.000	0.00002	0.000
Suburban	0.0020	0.002	-0.00263	0.020	-0.00351	0.008	0.00353	0.003	0.03261***	0.015
Non metro	0.0098***	0.005	-0.01094	0.022	-0.00120	0.009	0.00916*	0.007	0.08478***	0.050
Unidentified	0.0036	0.003	0.03492	0.034	-0.01003	0.006	-0.00054	0.003	-0.00799	0.012
Midwest	0.0041	0.003	0.02988	0.032	-0.00637	0.007	0.00222	0.004	-0.01529	0.009
South	0.0023	0.003	0.00921	0.024	-0.00487	0.007	0.00165	0.004	-0.00448	0.012
West	0.0040	0.004	0.02273	0.030	-0.00658	0.007	-0.00254	0.003	0.00768	0.018
Child 6 to 18 present	-0.0031	0.003	-0.02207	0.023	-0.00469	0.010	0.00452	0.005	-0.00992	0.015
No child present	-0.0048	0.004	-0.02060	0.028	-0.00491	0.011	0.00048	0.004	-0.02355	0.028
Spouse employed	0.0000	0.003	-0.02203	0.019	-0.00194	0.008	-0.00427	0.003	-0.00773	0.013
Ever married	0.0086*	0.006	0.02515	0.037	0.01049	0.014	0.00055	0.004	0.01055	0.020
Never married	0.0087*	0.005	-0.01838	0.024	0.00736	0.015	-0.00004	0.004	0.01260	0.031
Female	-0.0010	0.002	-0.01041	0.016	-0.00766	0.006	-0.00179	0.003	0.00912	0.007
High school	-0.0073***	0.002	0.02394	0.023	-0.00008	0.009	0.00273	0.003	-0.0305***	0.011
Some college	-0.0088***	0.002	0.03947	0.031	-0.00394	0.009	0.00083	0.003	-0.03199**	0.012
College graduate	-0.0109***	0.002	0.01878	0.035	-0.02293**	0.008	-0.00149	0.003	-0.02524**	0.011
Graduate school	-0.0122***	0.001								
Black nonHispanic	0.0027	0.004	0.02802	0.029	-0.00121	0.010	-0.00198	0.003	0.00233	0.014
White Hispanic	0.0007	0.004			0.03054***	0.015			-0.01998**	0.007
Black Hispanic	0.0180	0.032								
Others	0.0046	0.007			-0.01687	0.007			-0.01749	0.008
Hispanic and others			0.02527	0.026			0.00147	0.003		
Foreign-born citizen	0.0001	0.005	-0.0504***	0.009	-0.01107	0.008	-0.00024	0.005	0.12072***	0.081
Foreign worker	0.0108**	0.007	0.00998	0.025	0.01830	0.019	-0.00020	0.003	0.02040	0.046
Gross state product change	-0.0013	0.003	-0.00979	0.023	-0.01819*	0.009	0.00315	0.004	0.02063	0.014
Metro/non-metro unemp. rate change	0.0017	0.001	0.00302	0.007	0.00450	0.003	0.00065	0.001	0.00555	0.004
time	0.0007	0.000	0.00092	0.004	-0.00022	0.002	0.00122*	0.001	0.00017	0.002

\* Significant at  $p < 0.10$ , \*\* Significant at  $p < 0.05$ , \*\*\* Significant at  $p < 0.01$

jobs for workers whose year  $t$  status is full-time, or not in the labor force, relative to living in the central cities. This effect is statistically significant indicating the less flexible work opportunities in non-metro areas. Marital status is also related to transition into involuntary part-time work with single (ever married or never married) individuals at year  $t$  more likely to transition into involuntary part-time jobs compared to married with non-working spouse counterparts. Two possible explanations for this are that married workers could have more settled jobs or they are more likely to have savings and investments to support the transition period. As expected, more education decreases the likelihood of transition into involuntary part-time work from full-time jobs and not in the labor force categories. Full-time workers and individuals who are not in the labor force at time  $t$  with college or higher educational attainment are less likely to move into involuntary part-time jobs. One aspect that should be kept in mind is that transitions from full-time jobs to involuntary part-time work do not necessarily indicate job loss. Due to weak general economic conditions, firms may decide to reduce the hours of their workers, resulting in transition into involuntary part-time jobs.

Race and ethnicity positively associated with transition from full-time jobs into involuntary part-time jobs, but this association is not statistically significant. However, Hispanic (including both white and black Hispanic) voluntary part-time workers are more likely to end up having involuntary part-time work than white voluntary part-time employees.



Citizenship has a statistically significant effect on the likelihood of the transition from full-time to involuntary part-time work. Non-citizen immigrant workers are more likely to move into involuntary part-time work than the citizen workers. Finally, metro/non-metro unemployment rate change has a statistically significant positive effect on the likelihood of transition from the not in labor force category to involuntary part-time work, emphasizing that the larger the increase in the unemployment rate the higher the transition rate. As the unemployment rate increases, there are more entrants into involuntary part-time work than entrants into full-time work. Transitions from full-time jobs into involuntary part-time jobs could reflect reduction in hours, or changing position in the same firm; most new entrants do not have previous job connections, networking, and /or job experience. Thus, while economic impact was minimized for someone already in the labor force, this disadvantage was found to be more obvious for someone newly entering or returning to the labor force.

### **5.3.2. Transitions Out of Involuntary Part-time Jobs**

A set of multinomial probit models are estimated next to determine effects of individual and household demographic characteristics, residential location, and conditions within the economy on transitions out of involuntary part-time employment using matched and pooled CPS samples for 1996 through 2004. The choice set in the utility function includes full-time employment, involuntary part-time employment, voluntary part-time employment, unemployment, not in the labor force, and not at work categories. An additional model is estimated

including self-employment in the choice set. The choice set in the second estimation includes: full-time wage and salary employment, full-time self-employment, involuntary part-time wage and salary employment, involuntary part-time self-employment, voluntary part-time wage and salary employment, voluntary part-time self-employment, unemployment, not in the labor force, and not at work categories. The dependent variable in the model is the individual's labor force status at year  $t+1$ . The baseline category in each model is the same as in the previous models, i.e., full-time employment for the first set of models and full-time wage and salary employment in the second model. Since the focus is on exploring the  $t+1$  status of involuntary part-time workers at year  $t$ , the sample is restricted to workers whose year  $t$  labor status is involuntary part-time work and follows their year  $t+1$  behavior.

Table 5.10 presents the marginal effects and standard errors of the five labor outcomes relative to full-time employment. Age has a life-cycle and variable effect on different labor outcomes. Increasing age decreases the probability of moving from involuntary part-time jobs to voluntary part-time jobs up to one age than increase the probability of moving from involuntary part-time jobs to voluntary part-time jobs in favor of full-time jobs, however this effect is opposite for individuals who are not currently at work or who are staying in involuntary part-time jobs.

**Table 5.10. MNP Estimates of Transitions Out of Involuntary Part-time Employment by Men and Women in the U.S. 1996-2004 CPS**

Variables	Unemployed		Involuntary part-time		Voluntary part-time		Not at work		Not in labor force	
	Marginal Effect	Standard Error	Marginal Effect	Standard Error	Marginal Effect	Standard Error	Marginal Effect	Standard Error	Marginal Effect	Standard Error
Age	-0.0013	0.003	0.0091*	0.004	-0.0086	0.004	0.0066***	0.002	-0.0039	0.003
Age squared	0.0000	0.000	-0.0001	0.000	0.0001**	0.000	-0.0001***	0.000	0.0001	0.000
Metro	0.0065	0.012	-0.0051	0.017	0.0284	0.019	-0.0164**	0.007	-0.0228	0.013
Non-metro	0.0170	0.016	0.0178	0.020	0.0249	0.025	-0.0134*	0.005	-0.0234	0.014
Unidentified	-0.0020	0.013	-0.0061	0.020	0.0383*	0.023	0.0212**	0.011	-0.0197	0.015
Midwest	0.0090	0.013	-0.0290	0.017	0.0166	0.021	0.0025	0.007	0.0046	0.016
South	-0.0487***	0.010	-0.0512***	0.017	0.0099	0.020	-0.0058*	0.006	0.0230	0.015
West	-0.0180	0.011	-0.0160	0.018	0.0260	0.022	-0.0097	0.006	0.0047	0.016
Child aged 6 to 18	0.0131	0.017	-0.0176	0.022	0.0194	0.029	-0.0182**	0.007	0.0001	0.019
No child present	0.0099	0.016	-0.0245	0.024	0.0341	0.028	-0.0178	0.010	0.0122	0.020
Spouse employed	-0.0106	0.012	0.0098	0.018	0.0026	0.019	-0.0027	0.006	0.0138	0.014
Ever married	0.0286	0.020	0.0031	0.022	-0.0308	0.024	-0.0017	0.008	0.0150	0.020
Never married	0.0233*	0.018	0.0282*	0.024	-0.0205	0.025	0.0027	0.009	0.0268*	0.020
Female	-0.0230	0.008	0.0418***	0.013	0.0878***	0.015	0.0007**	0.005	0.0319***	0.010
High school graduate	-0.0165**	0.011	-0.0208**	0.016	-0.0032	0.019	-0.0089**	0.006	-0.0176**	0.013
Some college	-0.0224***	0.011	-0.0473***	0.017	-0.0320***	0.020	0.0000	0.007	-0.0379***	0.013
College graduate	-0.0426***	0.011	-0.0257**	0.021	-0.0129**	0.025	0.0007	0.008	-0.0523***	0.012
Graduate school	-0.0475***	0.013	-0.0365*	0.031	-0.0347*	0.035	0.0077	0.015	-0.0250*	0.022
Black nonHispanic	0.0369**	0.019	-0.0024	0.022	-0.0351	0.023	-0.0142	0.005	0.0604***	0.021
White Hispanic	0.0120	0.018	-0.0240	0.021	-0.0223	0.026	-0.0038	0.009	0.0087	0.020
Black Hispanic	-0.0455	0.023	-0.0771	0.046	0.1160	0.133	0.0467	0.052	0.0620	0.079
Others	0.0274	0.026	-0.0355	0.028	-0.0629	0.031	-0.0046	0.009	0.0563	0.034
Foreign-born citizen	-0.0226*	0.015	0.0109	0.032	-0.0703**	0.029	0.0126	0.015	-0.0110	0.021
Foreign worker	-0.0100	0.015	0.0166	0.025	-0.0398*	0.025	-0.0088	0.007	-0.0251*	0.017
Gross state product change	0.0287**	0.014	-0.0118	0.020	0.0087	0.023	-0.0111	0.008	0.0268**	0.016
Metro/non-metro unemp rate change	0.0059	0.004	0.0101	0.007	-0.0156	0.007	0.0066***	0.002	-0.0009	0.005
Time	0.0033	0.002	-0.0022	0.003	-0.0051	0.003	-0.0005	0.001	0.0052*	0.002

Log pseudolikelihood = -11396779, (N=4606)

\* Significant at  $p < 0.10$ , \*\* Significant at  $p < 0.05$ , \*\*\* Significant at  $p < 0.01$

Reference categories are: central city, Northeast region, children under age 6 present, male, less than high school education, married with non-employed spouse, white nonHispanic, and native-born citizen.

Residential status does not have a significant effect on transitions out of involuntary part-time jobs. However, involuntary part-time workers who live in the South are less likely to become unemployed or stay as involuntary part-time workers than those living in the Northeast region, indicating that living in the South increases the probability of moving upward to full-time jobs.

Compared to married workers, never married workers are more likely to become unemployed or remain in involuntary part-time jobs, and less likely to find full-time jobs. Compared to men, female involuntary workers are more likely to move into voluntary part-time jobs, leave the labor force, or remain as involuntary part-time workers. Educational attainment, as expected, has important effects on transitions of involuntary part-time workers. Transitions from involuntary part-time jobs into unemployment and out of the labor force are less likely with more education in favor of transitioning to full-time jobs. As expected black nonHispanic involuntary part-time workers are more likely to become unemployed or leave the labor force than white nonHispanic involuntary part-time workers.

Change in the Real Gross State Product (RGSP) is positively associated with leaving the labor force or moving into unemployment from involuntary part-time employment. As time passed (1996 through 2004), the probability of leaving the labor force increased.

Results reported in Table 5.10 showed that living in South, gender, and education are the only statistically significant associations that determine

transitions out of involuntary part-time employment. We further investigated these transitions considering self-employment as a class of workers in the model. The choice set in this estimation includes full-time wage and salary employment, full-time self-employment, involuntary part-time wage and salary employment, involuntary part-time self-employment, voluntary part-time wage and salary employment, voluntary part-time self-employment, unemployment, not in the labor force, and not at work categories. Results are reported in Table A.9 in the appendix.

Unlike previous models, the model including self-employment in the choice set has more variations. While probability of transitioning into full-time self-employment is positively related to age and living in non-metro areas, it is negatively related to female gender and level of education. Non-metro areas do not have greater job opportunities for involuntary part-time workers who are searching for full-time opportunities. One alternative for individuals who can not find jobs that match their preferred hours, is to move into self-employment. Involuntary part-time workers are more likely to transfer into self-employed full-time jobs than into wage and salary full-time jobs in non-metro areas.

Female workers are significantly less likely to transfer into any kind of self-employment labor force status than men. Their obvious choices are full-time or voluntary part-time wage and salary employment or leaving the labor force. Education is not significantly associated with any self-employment categories. However, results show a significant race/ethnicity effect on transition from

involuntary part-time jobs into self-employed full-time, self-employed involuntary part-time or self-employed voluntary part-time jobs. Compared with white nonHispanic workers, black nonHispanic, Hispanic and workers in the other race and ethnicity categories are less likely to become self-employed.

Tables 5.11 and 5.12 report the estimates of labor force status of women and men at year  $t+1$ , respectively. Interestingly, the factors that affect men's and women's transitions from involuntary part-time work are different and there is no statistically significant relationship between age or residence and transition out of involuntary part-time employment for women or men.

Again there is a strong correlation between transition probabilities and living in the South. Compared to living in the Northeast, female involuntary part-time workers in the South are less likely to remain employed as involuntary part-timer workers or transfer into unemployment, relative to transferring to full-time jobs. This is probably related to the lower voluntary and involuntary part-time rates in the South as compared to any other region in the United States (Partridge, 2003).

Marital status affects moving to unemployment or leaving the labor force. Married workers whose spouse is also working are less likely to move into unemployment in favor of full-time employment, but more likely to leave the labor force compared to married workers whose spouse is not working. In this case, the working spouse may provide enough income and benefits to support the family.

**Table 5.11. MNP Estimates of Transition Out of Involuntary Part-time Work Among Women in the U.S., 1996-2004  
CPS**

Variables	<u>Unemployed</u>		<u>Involuntary part-time</u>		<u>Voluntary part-time</u>		<u>Not at work</u>		<u>Out of labor force</u>	
	Marginal Effect	Standard Error	Marginal Effect	Standard Error	Marginal Effect	Standard Error	Marginal Effect	Standard Error	Marginal Effect	Standard Error
Age	-0.0035	0.004	0.0148*	0.007	-0.0108	0.007	0.0026	0.002	-0.0014	0.005
Age squared	0.0000	0.000	-0.0002	0.000	0.0001	0.000	-0.0000	0.000	0.0000	0.000
Suburban	0.0052	0.016	-0.0233	0.028	0.0523	0.031	-0.0205***	0.008	-0.0333	0.021
Non-metro	0.0058	0.020	0.0265	0.034	0.0335	0.040	-0.0127	0.006	-0.0046	0.026
Unidentified	-0.0055	0.016	-0.0167	0.032	0.0632*	0.039	0.0284**	0.016	-0.0259	0.023
Midwest	-0.0059	0.015	-0.0553	0.026	0.0434	0.035	0.0059	0.010	-0.0001	0.025
South	-0.0337***	0.013	-0.0906***	0.025	-0.0027	0.032	-0.0035	0.007	0.0414	0.025
West	-0.0206	0.014	-0.0357	0.029	0.0132	0.034	-0.0081	0.007	0.0023	0.024
Child aged 6 to 18	-0.0046	0.021	-0.0041	0.043	0.0341	0.048	-0.0014	0.009	-0.0041	0.031
No child present	-0.0033	0.021	-0.0036	0.042	0.0411	0.047	0.0027	0.009	0.0272	0.032
Spouse employed	-0.0489**	0.016	-0.0340	0.032	0.0185	0.036	-0.0044	0.008	0.0723**	0.029
Ever married	-0.0090	0.017	-0.0427	0.033	-0.0277	0.040	-0.0134**	0.006	0.0484	0.036
Never married	-0.0359*	0.016	0.0160	0.040	-0.0545	0.042	-0.0094	0.007	0.0525	0.035
High school graduate	0.0016	0.015	-0.0715**	0.027	0.0153	0.034	0.0044	0.010	0.0068	0.022
Some College	-0.0261**	0.014	-0.0950***	0.027	0.0221	0.037	0.0201	0.014	-0.0136	0.023
College and up	-0.0175	0.018	-0.0761***	0.027	0.0184	0.042	0.0325	0.022	-0.0730***	0.019
Black nonHispanic	0.0624**	0.029	-0.0217	0.032	-0.0655	0.034	-0.0076	0.007	0.0469	0.030
Hispanic	-0.0012	0.020	-0.0464	0.033	-0.0138	0.041	0.0379**	0.021	0.0014	0.028
Others	0.0415	0.037	-0.0294	0.049	-0.0564	0.056	0.0372**	0.023	-0.0008	0.043
Foreign-born citizen	-0.0144	0.020	-0.0173	0.045	-0.0882*	0.044	0.0030	0.010	0.0506	0.046
Foreign worker	-0.0109	0.019	0.0039	0.041	-0.0102	0.043	-0.0035	0.007	0.0410	0.035
Gross state product change	0.0146	0.020	-0.0062	0.034	0.0346	0.038	-0.0215**	0.009	0.0039	0.026
Metro/non-metro unemp rate change	-0.0068	0.006	0.0000	0.011	0.0023	0.012	0.0093***	0.003	-0.0020	0.008
Time	0.0118***	0.003	0.0008	0.005	-0.0207**	0.006	-0.0015	0.001	0.0130***	0.004

Log pseudo likelihood = -4946972.7 (N=1979)

Significant at  $p < 0.10$ , \*\* Significant at  $p < 0.05$ , \*\*\* Significant at  $p < 0.01$

Reference categories are: central city, Northeast region, children under age 6 present, male, less than high school education, married, white nonHispanic, and native-born citizens.

**Table 5.12. MNP Estimates of Transitions Out of Involuntary Part-time Work Among Men in the U.S., 1996-2004 CPS**

Variables	<u>Unemployed</u>		<u>Involuntary part-time</u>		<u>Voluntary part-time</u>		<u>Not at work</u>		<u>Out of labor force</u>	
	Marginal Effect	Standard Error	Marginal Effect	Standard Error	Marginal Effect	Standard Error	Marginal Effect	Standard Error	Marginal Effect	Standard Error
Age	0.0009	0.004	0.0045	0.005	-0.0072	0.005	0.0078***	0.002	-0.0042	0.004
Age squared	-0.0000	0.000	-0.0000	0.000	0.0001*	0.000	-0.0001***	0.000	0.0001*	0.000
Metro	0.0058	0.016	0.0139	0.021	0.0115	0.024	-0.0150*	0.008	-0.0174	0.015
Non-metro	0.0213	0.021	0.0222	0.026	0.0130	0.031	-0.0150**	0.006	-0.0310	0.015
Unidentified	-0.0019	0.017	0.0085	0.026	0.0256	0.028	0.0101	0.010	-0.0102	0.019
Midwest	0.0195	0.019	-0.0060	0.023	-0.0016	0.026	0.0004	0.008	0.0091	0.019
South	-0.0641***	0.013	-0.0141	0.024	0.0182	0.026	-0.0073	0.006	0.0083	0.017
West	-0.0188	0.015	0.0082	0.024	0.0235	0.028	-0.0107	0.008	0.0084	0.020
Child aged 6 to 18	0.0229	0.025	-0.0309	0.025	-0.0069	0.035	-0.0211***	0.007	-0.0018	0.025
No child present	0.0123	0.023	-0.0457*	0.029	0.0142	0.036	-0.0316**	0.015	-0.0052	0.027
Self-employed	0.0148	0.016	0.0252	0.020	-0.0102	0.022	-0.0035	0.007	-0.0134	0.015
Ever married	0.0555**	0.035	0.0366*	0.034	-0.0353	0.031	0.0164*	0.016	0.0269	0.029
Never married	0.0795***	0.029	0.0204**	0.029	-0.0026	0.031	0.0119*	0.014	0.0374**	0.026
High school graduate	-0.0304***	0.014	0.0138	0.020	-0.0210*	0.022	-0.0164***	0.006	-0.0310**	0.015
Some college	-0.0223***	0.014	-0.0176**	0.022	-0.0714***	0.021	-0.0120***	0.005	-0.0463***	0.014
College and above	-0.0634***	0.011	0.0008	0.026	-0.0506***	0.025	-0.0123***	0.005	-0.0290***	0.015
Black nonHispanic	0.0157	0.024	0.0220	0.034	-0.0123	0.032	-0.0156	0.005	0.0789***	0.031
Others	0.0251	0.024	-0.0254	0.025	-0.0319	0.029	-0.0220**	0.007	0.0410	0.028
Foreign-born citizen	-0.0344*	0.019	0.0406	0.046	-0.0647*	0.036	0.0054	0.018	-0.0286	0.019
Foreign worker	-0.0192	0.019	0.0294	0.031	-0.0602**	0.028	-0.0098	0.010	-0.0529***	0.014
Gross state product change	0.0340**	0.019	-0.0130	0.024	-0.0032	0.029	0.0014	0.010	0.0367**	0.019
Metro/non-metro unemployment rate change	0.0142**	0.006	0.0157*	0.008	-0.0235*	0.009	0.0026	0.003	-0.0017	0.006
Time	-0.0015	0.003	-0.0032	0.004	0.0026	0.004	-0.0001	0.001	0.0011	0.003

Log pseudo likelihood = -6354088.5 (N=2627)

Significant at  $p < 0.10$ , \*\* Significant at  $p < 0.05$ , \*\*\* Significant at  $p < 0.01$

Reference categories are: central city, Northeast region, children under age 6 present, male, less than high school education, married with non working spouse, white nonHispanic, and native-born citizen.



It is worth noting that education is not very deterministic and has variable effects on women's labor market choices. Compared to those with less than high school educational attainment, women with some college education are less likely to stay in involuntary part-time jobs or move into unemployment relative to moving into full-time jobs.

NonHispanic black involuntary part-time working women are more likely to become unemployed rather than moving up to full-time jobs compared to white nonHispanic women. Consistent with the literature, they remain disadvantaged in the labor market (Lichter et al. 1987). However, race/ethnicity is another variable that should be evaluated carefully, since those who are involuntarily part-time employed are already disadvantaged.

The conditions of the economy as measured by changes in the unemployment rate or in the Real Gross State Product (RGSP) do not appear to influence women's transitions from involuntary part-time work. Although changes in the unemployment rate and in the RGSP are expected to affect out-flow transitions positively, this effect might already be largely carried in the sample restriction. Time trend is statistically significant, and affects both upward and downward transitions positively, indicating that women employed on an involuntary part-time basis are more likely to move into unemployment, voluntary part-time employment or move out of the labor force rather than moving into full-time jobs as time increased over the period 1996-2004.

Table 5.12 shows that men exhibit different patterns of labor market behavior than women. Residential status and regional effects weakly explain movements out of involuntary part-time status for men. Involuntary part-time male workers who live in the South are less likely to become unemployed relative to those who live in the Northeast.

Involuntary part-time employed men with no child present at home are less likely to remain as involuntary part-time workers. Compared to those who are married with an employed spouse, ever or never married male involuntary part-time workers are more likely to: become unemployed, leave the labor force or remain as involuntary part-time workers than moving up to full-time jobs.

Unlike for women, educational attainment has important effects on the outcomes of involuntarily part-time employed men. The higher the educational attainment, the lower the probability of moving downward to unemployment or leaving the labor force altogether in favor of moving up to full-time work. There is no statistically significant association between race/ethnicity and transition probabilities of involuntary part-time employed men.

Changes in the RGSP have unexpected effects on men's involuntary part-time work transition outcomes. Improving economic conditions should encourage upward transitions and discourage downward transitions. However, improving economic conditions measured as the change in real GSP increases (weakly) the likelihood of those already in involuntary part-time jobs moving into unemployment (marginally) or leaving the labor force relative to moving into full-

time work. Changes in metro/non-metro unemployment rates should also have similar impacts. Increasing unemployment rates increase the likelihood of moving to unemployment as compared to taking full-time jobs. Unlike women, time does not have any significant effect on men's transition out of involuntary labor status.

The results from Tables 5.11 and 5.12 provide the models for U.S. men and women in their involuntary part-time job transitions. As the results clearly indicate, men and women have different patterns of transitioning from involuntary part-time status.

## CHAPTER 6

### SUMMARY AND CONCLUSION

#### 6.1. Summary of Results

This research is motivated by the relatively small number of studies that have closely examined involuntary part-time employment. It is important to study involuntary part-time labor because the economic cost of reduced hours not only means lost income and benefits for involuntarily part-time workers, but the loss of potential goods and services for the economy as well. An analysis of involuntary part-time employment therefore is an important part of understanding the nature and magnitude of the underutilization of human resources in the U.S. economy. There has been little effort to identify the factors associated with transitions into and out of involuntary part-time employment and to ascertain how the determinants might vary for men and women across place. To contribute to this understanding, this dissertation analyzed involuntary part-time employment and transition probabilities in U.S. labor markets differentiated by nonmetro, metro central city and suburban locations, focusing on transitions between involuntary part-time employment and full-time employment.

Pooled cross-sectional data from the March Current Population Survey (CPS) Annual Demographic files from 1996 to 2005 show that the prevalence of involuntary part-time rates varies between 2%-4% of the total labor force. Unlike voluntary part-time rates, trends for involuntary part-time employment rates are

largely comparable across gender and are observed to be parallel to the time-trend patterns of the unemployment rate in the U.S. economy over this time period.

These observations strongly suggest that it is important to separate voluntary and involuntary part-time employment when analyzing part-time labor markets.

Descriptive analyses of pooled cross-sectional March CPS data provide evidence of similarities and differences among factors influencing the likelihood of becoming an involuntary part-time worker. Generally and on average involuntary part-time workers in the U.S. are less educated and more likely to be black, Hispanic, younger and/or single. As hypothesized, the prevalence (percentage) of involuntary part-time workers among part-time employees is slightly higher in non-metro areas, followed by the metro central cities and suburban areas. Characteristics of involuntary part-time workers residing in different residential areas also differ. While involuntary part-time workers in the central cities are less likely to be nonHispanic white, married with a working spouse, and/or self-employed and are more likely to be immigrant non-citizen workers, involuntary part-time workers in non-metro areas are more likely to be white Hispanic, less educated, self-employed and/or native-born American citizens.

Multinomial probit analyses are conducted to verify whether or not the factors affecting the likelihood of involuntary part-time employment (relative to full-time employment) differ by gender and residence. Findings provide strong evidence to support the descriptive analyses and show that the factors affecting

the probability of involuntary part-time employment differ from those affecting voluntary part-time employment. Also, the determinants vary by gender, and residence characteristics that influence the labor market choices of men and women follow different patterns. Women are more likely to become involuntary part-time workers than men. Age, education, and residing in a non-metro area have similar influences on men's and women's involuntary part-time participation behavior while the effect of marital status and race/ethnicity differ between genders. Surprisingly, even though we are not able to detect a race/ethnicity disadvantage in the overall models, there is a slight indication of a race/ethnicity disadvantage in the gender differentiated models, and there is more (albeit not strong) evidence of both non-metro and gender disadvantages for involuntary part-time employment in these models.

Although residential status is not statistically very significant in the overall and gender differentiated models, the estimated residential models exhibit differences in characteristics of voluntary and involuntary part-time status of individuals relative to full-time employment status. It is also worth emphasizing here that all of the variables that have statistically significant explanatory power for involuntary part-time labor across residential areas also have the same explanatory power as those that explain unemployment status.

Further based on the findings that establish differences between involuntary part-time labor and other labor states, dynamics of transitions into and out of involuntary part-time employment are studied using matched and pooled

data from the March CPS for 1996 to 2004 for civilian, non-institutionalized, and non-student labor between 18 and 64 years of age, inclusive. To assess the dynamics of transitions into and out of involuntary part-time status for men and women by residence, in-flow and out-flow transition tables are provided.

The results from the transition table analyses support the conclusion that those defined as involuntary part-time workers are more likely than their voluntary part-time counterparts to transition to full-time jobs. Results suggest that involuntary part-time employment is more likely to be temporary, transitional and shorter in duration. This is illustrated by the higher transition rate between involuntary part-time employment and full-time employment than between full-time employment and any other labor state. However, these findings differ by gender, with the percentage of men moving between full-time hours and involuntary part-time hours being much higher than the percentage of women. Additionally it is documented that when the economy is unable to provide longer hours in both wage and salary jobs to match workers' preferences, self-employment opportunities provide greater flexibility to increase hours rather than waiting in the involuntary part-time state or leaving the labor force altogether.

Estimated binomial probit models provide evidence for the relatively disadvantaged position of individuals when moving into involuntary part-time work. While it is apparent that living in non-metro areas increases the likelihood of moving into involuntary part-time jobs for workers whose year  $t$  status is full-time, voluntary part-time or not in the labor force, for those who are entering or

reentering the full-time job market, *it is harder to find full-time jobs in non-metro areas*. Moreover, the higher likelihood of moving into involuntary part-time jobs from full-time jobs in non-metro areas indicates that for those who lose their jobs or hours due to slack work conditions and employer cut-back, it is harder to find alternative full-time jobs in non-metro areas. Evidence also suggests that a racial disadvantage exists and is found to be more obvious for those who are newly entering or returning to the labor force than among those already in the labor force.

Findings related to transitions out of involuntary part-time employment provide some evidence that it is harder for non-metro area residents to find full-time jobs than it is for central city residents. There also is a regional advantage for involuntary part-time workers living in the South; they are more likely to find full-time jobs and less likely to stay in involuntary part-time jobs or move downward to unemployment.

Transition models estimated separately for men and woman, and by residence, indicate more differences than similarities in the determinants of transitions out of involuntary part-time employment, providing evidence that men and women have different patterns of transitioning from involuntary part-time status. While more variables explain transitions among U.S. men into unemployment or out of the labor force from involuntary part-time employment, women's transitions into voluntary part-time employment from involuntary part-time employment are better explained by the estimated models.



The same residential effect occurred in women's transitions out of involuntary part-time employment: living in non-metro areas relative to living in the central cities increases the likelihood of women remaining as involuntary part-time workers. However, residential status does not have an impact on men's transitions out of involuntary part-time employment. Further, while findings in the first half of the dissertation provide evidence for differences between voluntary and involuntary part-time employment relative to full-time employment and gender and residential advantages and disadvantages, the evidence in the second half shows that female and non-metro area involuntary part-time workers face disadvantages when seeking full-time work.

*Finally, the probability of transitioning into full-time work is still lower than 50% highlighting the difficulty of a worker finding full-time hours over a one-year period. Moreover, gender and residential disadvantages exist for those who want full-time work, i.e., women are less likely to move into full-time jobs than men and workers who live in central cities and non-metro areas are also less likely to find full-time jobs than their suburban counterparts.*

## **6.2. Discussion and Implications for Policy**

Rural and non-metro areas in the U.S. have traditionally lagged behind urban and metro areas as measured by several different indicators of labor market success (high employment, a prevalence of 'good jobs') as opposed to labor market distress (high unemployment rates, high underemployment rates). It is often argued that one of the reasons that non-metro areas *appear to be more*

*distressed* is that relevant measures (e.g., poverty rates, wage levels) fail to correct for differentials in cost-of-living. However, this study has diverged from many past studies by focusing on involuntary part-time work which is entirely based on hours of work rather than monetary measures. Like unemployment rates, rates of involuntary part-time work measure an important dimension of the economy not affected by cost-of-living differentials. Findings show that there is a non-metro disadvantage, even compared to the central cities. That is, the study results show that the likelihood of involuntary part-time employment is higher in non-metro areas of the U.S. – involuntary part-time workers living in non-metro areas would prefer that their jobs provide them with more work time.

Further, the variables found to affect the likelihood of being part of the involuntary part-time workforce mirror those variables that influence the likelihood of being unemployed. The very workers viewed as being the most marginal are in many respects identical to the unemployed and the involuntary part-time employed. It is reasonable to expect that those at the bottom of the job queue would have similar characteristics that affect their sorting into labor states. In addition, in the post-welfare reform era, many workers who were previously unemployed may indeed now have moved into involuntary part-time employment so that they are ‘at work.’

From the viewpoint of policy, the similarities between unemployment and involuntary part-time employment perhaps suggest similar policies on the demand side (to create more jobs and better jobs) but the question of appropriate policies

that address the supply side also is raised. Many workers in involuntary part-time employment are found to have low levels of education, be female and single, and be a foreign worker most likely of Hispanic ethnicity. They are also more likely either to be younger workers or older workers beyond mid-life. Targeting full-time employment opportunities to these segments of the population can serve to reduce the involuntary part-time work problem. However, the policy challenge is: how to help these segments of the population to move *upward* from ‘bad jobs’ to ‘good jobs.’ Interestingly, the upward movement of the involuntary workforce into full-time jobs can actually be thought of as reducing the need for special service infrastructure at the local level -- since multiple job-holding would become less of a need.

Two other points are worth mentioning. Assessing the differences between voluntary and involuntary part-time workers has also shown that although many women still take part-time jobs because they prefer part-time work, many others currently employed in part-time jobs would actually prefer more hours of work – i.e., they are not part-time by choice. The stereotype of female part-time employees *preferring* to work part-time is only somewhat true. Further, this analysis also raises the question of the behavior of employers and the extent to which employers use part-time employment as a strategy to reduce labor costs and/or as a method to screen workers. The transition models suggest that some workers are able to move upward into full-time jobs even when the

economy is not improving, although more research is warranted on this potential effect.

### **6.3. Limitations and Suggestions for Future Research**

When the results from this study are evaluated and compared with existing studies, comparisons should be done cautiously for several reasons. First, the multinomial probit estimates use full-time employment status as the baseline choice; therefore, results from these estimations are relative to full-time employment status. Several of the models also use a restricted sample, with the focus being on the labor market experiences of the involuntary part-time subsample. Second, the comparability of part-time labor market analyses before and after 1995 using the Current Population Survey is an important issue. Due to changes in the March CPS survey questionnaire that influence definition and measurement of voluntary and involuntary part-time employment when using these data, the analyses presented in this dissertation were restricted to the period after 1996.

The ‘movers’ in the Current Population Survey also present a challenge for the transition analyses, both descriptive and econometric. Due to sample attrition, we lose some information about involuntary part-time employees through the matching process. Although such panels have unique advantages in labor market studies, not following movers may lead to bias in longitudinal estimates using the matched CPS files (Neumark and Kawaguchi, 2001).

Therefore, there is a slight possibility that the results of the involuntary part-time labor analysis might be understated.

Finally, the most significant limitation of this study is the insufficient supply of information in the March CPS about relatively small geographical areas. The inability to link individual-level observations to measures of local labor market conditions and to define “rural” areas accurately is a significant shortcoming of the CPS. However, CPS data that will provide finer geographic detail are soon to become publicly available. Incorporating that future data into the analyses will expand this research and will significantly further understanding on the demand side.

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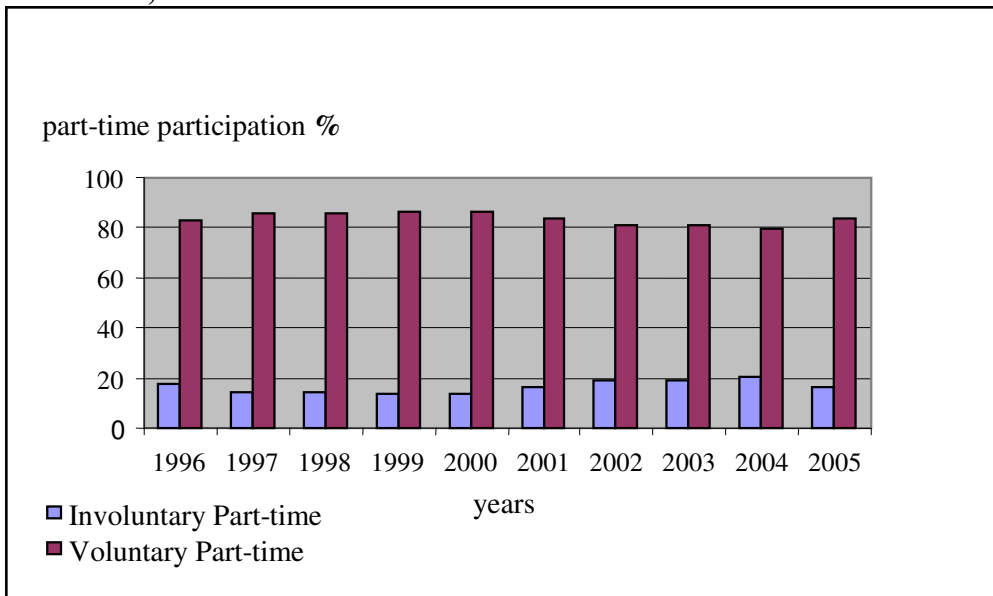
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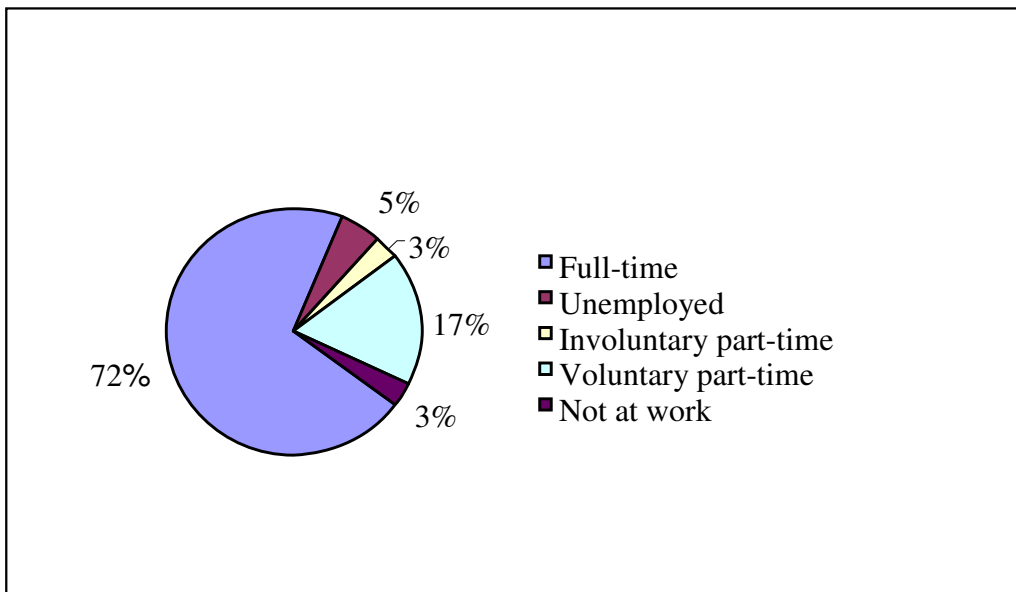
## APPENDIX

**Figure A. 1. Voluntary and Involuntary Part-time Labor Force Participation in the U.S., 1996-2005 CPS**



Source: CPS March Demographic Files 1996-2005  
 Associated data tables are included in Appendix Table A.1.

**Figure A.2. Labor Force Participation Rates by Labor Status Categories, 1996-2005 CPS**



Source: CPS March Demographic Files 1996-2005. Annual average rates.  
 Associated data table is included in Appendix Table A.2.

**Table A.1. Labor Force Participation Percentages of Individuals Aged 18-65**

Years	Full-time %	Unemployed %	Voluntary part-time %	Involuntary part-time %	Not at work %	Row total %
1996	69.49	5.84	17.87	3.63	3.16	100
1997	70.83	5.4	17.65	3.06	3.07	100
1998	70.59	4.91	18.34	2.92	3.24	100
1999	72.04	4.53	17.49	2.71	3.22	100
2000	72.72	4.11	17.46	2.19	3.51	100
2001	72.43	4.67	17.21	2.4	3.29	100
2002	70.23	6.13	17.21	3.13	3.30	100
2003	70.55	6.36	16.85	3.29	2.95	100
2004	71.29	5.93	16.34	3.34	3.10	100
2005	71.25	5.51	17.08	3.22	2.94	100
1996-2005	72	5	17	3	3	100

Source: CPS Annual March Demographic Files 1996-2005

**Table A.2. Part-time Labor Force Participation of Individuals Aged 18-65**

Years	Involuntary part-time %	Voluntary part-time %	Total part-time %
1996	16.90	83.10	100
1997	14.79	85.21	100
1998	13.73	86.27	100
1999	13.42	86.58	100
2000	11.14	88.86	100
2001	12.24	87.76	100
2002	15.37	84.63	100
2003	16.35	83.65	100
2004	16.96	83.04	100
2005	15.86	84.14	100
1996-2005	14.73	85.27	100

Source: CPS Annual March Demographic Files 1996-2005

**Table A.3. Labor Force Participation Rates of U.S. Civilian Labor Force 1996-2005**

Years	<u>Full-time</u>		<u>Unemployed</u>		<u>Involuntary part-time</u>		<u>Voluntary part-time</u>		<u>Not at work</u>	
	men	women	men	women	men	women	men	women	men	women
1996	40.85	28.64	3.56	2.28	1.86	1.76	5.99	11.88	1.32	1.84
1997	41.38	29.44	3.08	2.31	1.43	1.63	6.15	11.5	1.22	1.84
1998	41.67	28.92	2.8	2.12	1.43	1.48	6.1	12.25	1.42	1.82
1999	41.85	30.19	2.46	2.08	1.4	1.32	5.84	11.66	1.45	1.77
2000	42.21	30.51	2.23	1.88	1.12	1.07	5.89	11.58	1.47	2.05
2001	41.4	31.03	2.73	1.94	1.23	1.17	5.91	11.3	1.42	1.87
2002	40.71	29.53	3.5	2.63	1.67	1.47	5.61	11.6	1.52	1.78
2003	40.91	29.64	3.7	2.66	1.72	1.57	5.52	11.33	1.31	1.64
2004	41.11	30.17	3.4	2.53	1.76	1.58	5.53	10.82	1.39	1.71
2005	41.44	29.81	3.14	2.37	1.72	1.5	5.97	11.12	1.34	1.6

Source: CPS Annual March Demographic Files (age 18 and above civilian labor force).

\*Row totals are equal to 100 %.

**Table A.4. MNP Estimates of Characteristics of Labor Force Status of U.S. Women, 1996 to 2004 March CPS**

Variables	<u>Unemployed</u>		<u>Involuntary part-time</u>		<u>Voluntary part-time</u>		<u>Not at Work</u>	
	Marginal Effect	Standard Error	Marginal Effect	Standard Error	Marginal Effect	Standard Error	Marginal Effect	Standard Error
Age	-0.0032***	0.001	-0.0007***	0.001	-0.0363***	0.003	-0.0025***	0.001
Age squared	0.0000***	0.000	0.0000***	0.000	0.0004***	0.000	0.0000***	0.000
Suburban	-0.0067	0.005	0.0018	0.004	0.0254**	0.011	-0.0026	0.005
Non-metro	0.0013	0.006	0.0094**	0.006	-0.0075	0.014	0.0118*	0.008
Unidentified	0.0030	0.006	0.0020	0.004	-0.0047	0.013	0.0037	0.006
Midwest	-0.0024	0.005	-0.0014	0.004	-0.0068	0.012	-0.0020	0.006
South	-0.0018	0.005	-0.0063***	0.004	-0.0475***	0.011	-0.0071**	0.005
West	0.0030	0.006	0.0000	0.004	-0.0216*	0.013	-0.0064	0.006
Child aged 6 to 18	-0.0056	0.006	0.0065	0.005	0.0163	0.015	-0.0222***	0.006
No child present	-0.0144***	0.006	0.0048	0.005	-0.0989***	0.015	-0.0167***	0.007
Spouse employed	-0.0149*	0.006	-0.0031	0.005	0.0358**	0.013	0.0060	0.006
Ever married	0.0099	0.008	0.0143	0.007	-0.0643***	0.016	0.0002	0.008
Never married	0.0124	0.008	0.0041	0.006	0.0200	0.018	0.0005	0.008
High school graduate	-0.0276***	0.005	-0.0112***	0.004	-0.0396***	0.015	-0.0163***	0.007
Some college	-0.0397***	0.005	-0.0155***	0.004	-0.0022	0.016	-0.0055*	0.007
College graduate	-0.0385***	0.004	-0.0208***	0.003	-0.0334***	0.016	-0.0098**	0.007
Graduate	-0.0362***	0.003	-0.0197***	0.003	-0.0413***	0.019	-0.0018	0.009
Black nonHispanic	0.0405***	0.008	0.0020	0.005	-0.0961***	0.013	-0.0032	0.007
White Hispanic	0.0074	0.007	0.0169**	0.006	-0.0511***	0.014	-0.0074	0.007
Black Hispanic	0.0140	0.028	-0.0225***	0.003	-0.1642***	0.038	-0.0266	0.018
Others	0.0022	0.010	-0.0096*	0.005	-0.0351*	0.021	-0.0073	0.009
Foreign-born citizen	-0.0025	0.009	0.0092	0.008	-0.0569**	0.020	0.0091	0.011
Foreign worker	-0.0016	0.007	0.0186**	0.007	-0.0271***	0.018	-0.0012	0.009
Self-employed	-0.0195***	0.006	0.0053***	0.006	0.1340	0.018	0.0442***	0.010
Time	0.0005	0.001	-0.0002	0.001	-0.0006	0.002	-0.0018**	0.001
Gross state product	0.0676	0.000	0.112**	0.000	0.0186	0.000	0.0280	0.000
Metro/non-metro unemployment rate	0.0059***	0.002	0.0051***	0.001	-0.0010	0.004	0.0011	0.002

Pseudo log likelihood = -26472676, N = 15712

Significant at  $p < 0.10$ , \*\* Significant at  $p < 0.05$ , \*\*\* Significant at  $p < 0.01$

Reference group is: central city, Northeast region, male, children under age 6 present, less than high school education, married spouse not working, white nonHispanic, and native-born citizens.

**Table A.5. MNP Estimates of Characteristics of Labor Force Status of U.S. Men, 1996 to 2005 March CPS**

Variables	Unemployed		Involuntary part-time		Voluntary part-time		Not at Work	
	Marginal Effect	Standard Error	Marginal Effect	Standard Error	Marginal Effect	Standard Error	Marginal Effect	Standard Error
Age	-0.0031***	0.001	-0.0006***	0.001	-0.0263***	0.002	-0.0030***	0.001
Age squared	0.0000***	0.000	0.0000***	0.000	0.0003***	0.000	0.0000***	0.000
Suburban	-0.0039	0.005	0.0018	0.003	-0.0122*	0.007	0.0024	0.004
Non-metro	-0.0008	0.006	0.0114**	0.005	-0.0043	0.009	0.0001	0.005
Unidentified	0.0135**	0.007	0.0067**	0.004	0.0028	0.008	0.0043	0.005
Midwest	0.0092	0.006	-0.0020	0.004	-0.0064	0.008	-0.0005	0.004
South	-0.0060	0.005	-0.0032	0.003	0.0027	0.007	-0.0054	0.004
West	0.0036	0.006	0.0039	0.004	0.0100	0.008	-0.0068	0.004
Child aged 6 to 18	0.0022	0.006	0.0011	0.004	0.0176*	0.010	0.0014	0.005
No child present	0.0024	0.007	0.0032	0.004	-0.0096	0.010	0.0057	0.005
Spouse employed	-0.0127**	0.006	-0.0023	0.004	0.0049	0.009	-0.0037	0.004
Ever married	0.0234***	0.011	0.0099**	0.008	0.0318**	0.016	-0.0112	0.005
Never married	0.0305***	0.009	0.0196***	0.007	0.0769***	0.014	-0.0050	0.005
High school graduate	-0.0192***	0.004	-0.0136***	0.003	-0.0414***	0.007	-0.0108***	0.004
Some college	-0.0277***	0.004	-0.0193***	0.003	-0.0045*	0.008	-0.0085***	0.004
College graduate	-0.0381***	0.004	-0.0211***	0.002	-0.0354***	0.008	-0.0155***	0.003
Graduate	-0.0437***	0.003	-0.0183***	0.002	-0.0260***	0.009	-0.0056**	0.005
Black nonHispanic	0.0238***	0.008	0.0086**	0.006	-0.0042	0.010	0.0015	0.005
White Hispanic	0.0083	0.007	0.0024	0.004	-0.0181*	0.009	-0.0011	0.005
Black Hispanic	0.0201	0.033	0.0276	0.031	-0.0045	0.041	-0.0035	0.022
Others	0.0188**	0.011	0.0014	0.006	0.0052	0.013	0.0104	0.009
Foreign-born citizen	-0.0209***	0.006	0.0032	0.006	-0.0133	0.012	-0.0084*	0.005
Foreign worker	-0.0108**	0.006	0.0064	0.005	-0.0286***	0.009	-0.0079**	0.004
Self-employed	-0.0269***	0.005	0.0294***	0.006	0.0301***	0.009	0.0251***	0.006
Time	-0.0007	0.001	-0.0011**	0.001	-0.0008	0.001	0.0001	0.001
Gross state product	0.0678	0.000	0.1020***	0.000	0.203**	0.000	0.0407	0.000
Metro/non-metro unemployment rate	0.0104***	0.002	-0.0007	0.001	-0.0024	0.003	0.0011	0.001

Pseudo log likelihood = -24311614 N = 17344\* Significant at  $p < 0.10$ , \*\* Significant at  $p < 0.05$ , \*\*\* Significant at  $p < 0.01$

Reference categories are: central city, Northeast region, children under age 6 present, less than high school education, married spouse not working, white nonHispanic, and native-born citizens.



**Table A.6. MNP Estimates of Characteristics of Labor Force Status of Men and Women Living in U.S. Central Cities**

Variables	<u>Unemployed</u>		<u>Involuntary part-time</u>		<u>Voluntary part-time</u>		<u>Not at work</u>	
	Marginal Effect	Standard Error	Marginal Effect	Standard Error	Marginal Effect	Standard Error	Marginal Effect	Standard Error
Age	-0.0044***	0.002	-0.0021**	0.001	-0.0314***	0.003	-0.0021***	0.001
Age squared	0.0001***	0.000	0.0000	0.000	0.0004***	0.000	0.0000***	0.000
Midwest	0.0067	0.009	0.0078	0.007	0.0049	0.015	-0.0088	0.006
South	0.0005	0.008	0.0010	0.006	-0.0043	0.014	-0.0049	0.006
West	0.0045	0.008	0.0091*	0.006	0.0009	0.014	-0.0038	0.006
Child aged 6 to 18	-0.0061	0.010	0.0148**	0.008	0.0188	0.017	-0.0099	0.007
No child	-0.0117	0.010	0.0122	0.006	-0.0327**	0.017	-0.0054	0.007
Female	-0.0031**	0.006	0.0033***	0.004	0.1080***	0.010	0.0207***	0.005
Spouse employed	-0.0101	0.010	0.0061	0.006	0.0285*	0.015	-0.0032	0.007
Ever married	0.0298*	0.017	0.0109	0.010	-0.0330	0.019	-0.0123	0.007
Never married	0.0282***	0.014	0.0204***	0.009	0.0449***	0.019	-0.0128	0.007
High school	-0.0174***	0.008	-0.0103***	0.004	-0.0253**	0.015	-0.0089*	0.007
Some college	-0.0404***	0.007	-0.0184***	0.004	0.0234	0.017	-0.0026	0.007
College	-0.0487***	0.006	-0.0200***	0.004	-0.0177**	0.017	-0.0141***	0.007
Graduate	-0.0546***	0.005	-0.0212***	0.003	-0.0069	0.020	-0.0065	0.008
Black	0.0345***	0.010	0.0087	0.006	-0.0567***	0.012	0.0067	0.007
Hispanic	0.0037	0.009	0.0098	0.006	-0.0342**	0.014	-0.0071	0.006
Others	0.0031	0.014	0.0028	0.008	-0.0024	0.020	0.0153	0.013
Foreign born citizen	-0.0111	0.010	0.0167	0.010	-0.0341*	0.018	-0.0122*	0.007
Foreign worker	-0.0095	0.009	0.0137*	0.007	-0.0212	0.015	-0.0031	0.007
Self-employed	-0.0227	0.010	0.0401***	0.012	0.0679***	0.020	0.0389***	0.012
Time	-0.0013	0.001	-0.0006	0.001	0.0007	0.002	-0.0006	0.001
Gross state product	0.0303	0.000	0.0629	0.000	0.442***	0.000	0.0303	0.000
Metro/non-metro unemployment rate	0.0120***	0.003	0.0025	0.002	-0.0089	0.005	0.0021	0.002

Pseudo log likelihood = -12074263, N=7635

\* Significant at  $p < 0.10$ , \*\* Significant at  $p < 0.05$ , \*\*\* Significant at  $p < 0.01$

Reference group is: Northeast region, children under age 6 present, male, less than high school education, married spouse not working, white nonHispanic and native-born citizens.

**Table A.7 MNP Estimates of Characteristics of Labor Force Status of Men and Women Living in U.S. Suburban Areas**

Variables	<u>Unemployed</u>		<u>Involuntary part-time</u>		<u>Voluntary part-time</u>		<u>Not at work</u>	
	Marginal Effect	Standard Error	Marginal Effect	Standard Error	Marginal Effect	Standard Error	Marginal Effect	Standard Error
Age	-0.0020***	0.001	-0.0004***	0.001	-0.0303***	0.002	-0.0030***	0.001
Age squared	0.0000***	0.000	0.0000***	0.000	0.0004***	0.000	0.0000***	0.000
Midwest	-0.0018	0.005	-0.0004	0.003	-0.0133	0.008	0.0009	0.004
South	-0.0034	0.004	-0.0046**	0.003	-0.0282***	0.008	-0.0041*	0.004
West	0.0053	0.005	0.0016	0.004	-0.0096***	0.010	-0.0087*	0.005
Child aged 6 to 18	0.0000	0.005	0.0007	0.004	0.0147***	0.011	-0.0126**	0.005
No child	-0.0063**	0.006	0.0051	0.004	-0.0549***	0.011	-0.0092***	0.005
Female	-0.0068***	0.003	0.0026***	0.002	0.1791***	0.007	0.0176***	0.003
Spouse employed	-0.0107*	0.005	-0.0055**	0.004	0.0242**	0.010	0.0013**	0.005
Ever married	0.0113	0.008	0.0124***	0.007	-0.0084	0.015	-0.0044***	0.006
Never married	0.0242***	0.009	0.0074***	0.006	0.0739***	0.016	0.0041***	0.007
High school	-0.0236***	0.004	-0.0153***	0.003	-0.0576***	0.011	-0.0131***	0.005
Some college	-0.0315***	0.004	-0.0208***	0.003	-0.0138**	0.011	-0.0081*	0.005
College	-0.0359***	0.004	-0.0229***	0.002	-0.0475***	0.011	-0.0124*	0.005
Graduate	-0.0350***	0.003	-0.0192***	0.002	-0.0542***	0.012	-0.0017	0.006
Black	0.0255***	0.007	0.0010	0.005	-0.0377***	0.012	-0.0099	0.005
Hispanic	0.0101	0.006	0.0024	0.004	-0.0275**	0.011	-0.0006	0.006
Others	0.0136	0.011	-0.0065	0.005	-0.0082	0.017	-0.0089	0.007
Foreign born citizen	-0.0151**	0.006	0.0022	0.006	-0.0423***	0.014	0.0040	0.007
Foreign worker	-0.0058	0.006	0.0107	0.006	-0.0401***	0.013	-0.0083*	0.006
Self-employed	-0.0214**	0.004	0.0088***	0.005	0.0761***	0.012	0.0259***	0.007
Time	-0.0006	0.001	-0.0015***	0.000	-0.0012	0.001	-0.0005	0.001
Gross state product	0.1230**	0.000	0.0049	0.000	0.0202	0.000	0.0312	0.000
Metro/non-metro unemployment rate	0.0070***	0.002	0.0034***	0.001	-0.0016	0.003	0.0011	0.002

Pseudo log likelihood = -27750586, N=18281

\* Significant at  $p < 0.10$ , \*\* Significant at  $p < 0.05$ , \*\*\* Significant at  $p < 0.01$ 

Reference categories are: Northeast region, children under age 6 present, male, less than high school education, married spouse not working, white nonHispanic, and native-born citizens.

**Table A.8. MNP Estimates of Characteristics of Labor Force Status of Men and Women Living in U.S. Non-metro Areas**

Variables	<u>Unemployed</u>		<u>Involuntary part-time</u>		<u>Voluntary part-time</u>		<u>Not at work</u>	
	Marginal Effect	Standard Error	Marginal Effect	Standard Error	Marginal Effect	Standard Error	Marginal Effect	Standard Error
Age	-0.0038***	0.002	-0.0008***	0.001	-0.0346***	0.003	-0.0044***	0.002
Age squared	0.0000***	0.000	0.0000***	0.000	0.0004***	0.000	0.0001***	0.000
Midwest	0.0167	0.012	-0.0191**	0.007	0.0147	0.019	-0.0003	0.010
South	-0.0109	0.011	-0.0110	0.008	-0.0079	0.019	-0.0138*	0.010
West	-0.0082	0.011	-0.0101	0.008	0.0378	0.025	-0.0048	0.010
Child aged 6 to 18	-0.0028	0.011	0.0016	0.009	0.0760***	0.022	0.0052	0.011
No child	0.0080	0.012	-0.0077	0.009	0.0282	0.021	0.0135	0.011
Female	-0.0063***	0.006	0.0123***	0.005	0.1579***	0.012	0.0348***	0.006
Spouse employed	-0.0254**	0.011	-0.0018	0.008	-0.0038	0.017	0.0049	0.008
Ever married	0.0137	0.015	0.0280**	0.015	-0.0344	0.021	-0.0043	0.012
Never married	0.0161*	0.015	0.0339***	0.016	0.0329*	0.025	-0.0065	0.011
High school	-0.0284***	0.009	-0.0064*	0.008	-0.0429***	0.017	-0.0233***	0.008
Some college	-0.0325***	0.008	-0.0073*	0.008	-0.0386***	0.017	-0.0142**	0.008
College	-0.0368***	0.007	-0.0184***	0.006	-0.0637***	0.017	-0.0184***	0.007
Graduate	-0.0476***	0.005	-0.0132*	0.009	-0.0301*	0.025	-0.0101	0.010
Black	0.0494***	0.019	0.0073	0.011	-0.0414	0.021	0.0090	0.016
Hispanic	0.0153	0.019	0.0468***	0.022	-0.0316	0.024	-0.0130	0.010
Others	0.0389	0.023	-0.0170	0.009	-0.0503	0.027	0.0169	0.018
Foreign born citizen	-0.0413*	0.009	-0.0044	0.016	0.0350	0.073	0.0061	0.028
Foreign worker	-0.0101	0.017	0.0031	0.016	-0.0335	0.033	-0.0009	0.018
Self-employed	-0.0348**	0.007	0.0407***	0.012	0.0569***	0.018	0.0487***	0.012
Time	0.0025	0.001	0.0017*	0.001	0.0007	0.002	-0.0013	0.001
Gross state product	0.0679	0.000	0.0241	0.000	0.568*	0.000	0.0389	0.000
Metro/non-metro unemployment rate	0.0130***	0.002	0.0002	0.002	0.0009	0.005	0.0010	0.002

Pseudo log likelihood = -9306949, N = 7171

Reference categories are: Northeast region, children under age 6 present, male, less than high school education, married spouse not working, white nonHispanic, and native-born citizens.

**Table A.9. MNP Estimates of Transitions Out of Involuntary Part-time Employment**

	Full-time self-employed		unemployed		Involuntary wage and salary		Involuntary self-employed		Voluntary wage and salary		Voluntary self-employed		Not at work		Not in the labor force	
	ME	SD	ME	SD	ME	SD	ME	SD	ME	SD	ME	SD	ME	SD	ME	SD
Age	0.0126 ***	0.003	-0.0022	0.003	0.0043	0.004	0.0047***	0.002	-0.0093	0.004	0.0016	0.002	0.0067***	0.002	-0.0055	0.003
Age squared	-0.0001 ***	0.000	0.0000	0.000	0.0000	0.000	0.0000**	0.000	0.0001	0.000	0.0000	0.000	-0.0001***	0.000	0.0001	0.000
Suburban	0.0188	0.011	0.0070	0.013	0.0025	0.016	-0.0084	0.007	0.0555**	0.018	-0.0174*	0.007	-0.0178 **	0.007	-0.0253	0.013
Non metro	0.0221**	0.015	0.0188 *	0.017	0.0113	0.019	0.0013	0.007	0.0549**	0.025	-0.0157	0.007	-0.0148	0.006	-0.0257	0.015
Unidentified	0.0093	0.012	-0.0008	0.014	0.0030	0.019	-0.0080	0.007	0.0272*	0.021	0.0113	0.010	0.0220***	0.011	-0.0201	0.016
Midwest	-0.0004	0.011	0.0107	0.014	-0.0297	0.016	-0.0002	0.007	0.0132	0.020	0.0030	0.009	0.0018	0.007	0.0040	0.016
South	0.0168	0.012	-0.0514 ***	0.011	-0.0481	0.016	-0.0001	0.007	-0.0132	0.018	0.0164	0.010	-0.0066 *	0.006	0.0237	0.016
West	0.0140	0.012	-0.0166	0.012	-0.0109	0.017	-0.0027	0.007	0.0135	0.020	0.0051	0.010	-0.0105	0.007	0.0057	0.017
Child 6 to 18 present	0.0082	0.014	0.0142	0.018	-0.0020	0.022	-0.0129	0.007	0.0402	0.029	-0.0165	0.009	-0.0195 **	0.008	0.0017	0.021
No child present	-0.0120	0.016	0.0091	0.017	-0.0011	0.022	-0.0213 **	0.010	0.0405	0.027	-0.0072	0.011	-0.0193 *	0.011	0.0128	0.021
Spouse employed	-0.0060	0.009	-0.0103	0.013	-0.0028	0.017	0.0113	0.007	-0.0136	0.018	0.0094	0.007	-0.0029	0.007	0.0152	0.015
Ever married	-0.0102	0.011	0.0292	0.021	-0.0150	0.020	0.0167	0.011	-0.0169	0.022	-0.0126	0.008	-0.0024	0.008	0.0147	0.021
Never married	-0.0214	0.012	0.0258 *	0.019	0.0232	0.022	0.0021	0.009	0.0069	0.024	-0.027**	0.008	0.0020	0.010	0.0288*	0.021
Female	-0.0660 ***	0.008	-0.0251	0.009	0.0712	0.013	-0.0265***	0.005	0.1112 ***	0.014	-0.0224**	0.005	-0.0010	0.005	0.0314***	0.011
High school	0.0108	0.011	-0.0162 **	0.011	-0.0304	0.015	0.0109	0.007	-0.0039	0.018	0.0009	0.007	-0.0094 **	0.006	-0.0173 *	0.014
Some college	0.0189	0.014	-0.0236 ***	0.012	-0.0417	0.016	-0.0022	0.007	-0.0246 ***	0.019	-0.0049*	0.008	-0.0003	0.007	-0.0397 ***	0.014
College graduate	0.0347	0.018	-0.0449 ***	0.012	-0.0360	0.018	0.0142	0.011	-0.0179 *	0.024	0.0071	0.011	0.0007	0.009	-0.0549 ***	0.013
Graduate school	0.0344	0.026	-0.0496 ***	0.014	-0.0104	0.033	-0.0122 **	0.007	-0.0788 ***	0.024	0.0276	0.022	0.0091	0.016	-0.0224	0.024
Black nonHispanic	-0.0406 ***	0.008	0.0369 *	0.020	0.0200	0.022	-0.0205 **	0.005	-0.0242	0.021	-0.0084	0.009	-0.0157 *	0.006	0.0606**	0.022
Hispanic	-0.0282 **	0.012	0.0070	0.018	0.0010	0.021	-0.0215 ***	0.005	0.0025	0.026	-0.0193**	0.006	-0.0034	0.009	0.0087	0.020
Others	-0.0250 *	0.012	0.0241	0.027	-0.0184	0.028	-0.0180 **	0.005	-0.0331	0.031	-0.0216**	0.007	-0.0062	0.009	0.0540	0.035
Foreign-born citizen	-0.0125	0.016	-0.0247 *	0.016	-0.0218	0.026	0.0381	0.022	-0.0574	0.026	-0.0122	0.010	0.0118	0.015	-0.0148	0.022
Foreign worker	0.0279	0.023	-0.0117	0.016	0.0051	0.022	0.0155	0.016	-0.0218 **	0.024	-0.0147	0.007	-0.0092	0.008	-0.0281	0.018
Gross state product change	-0.0184	0.012	0.0304**	0.015	-0.0127	0.018	-0.0003	0.007	0.0230	0.022	-0.0126*	0.010	-0.0126	0.008	0.0277*	0.017
Metro/non-metro unemp. rate change	-0.0041	0.003	0.0061	0.005	0.0072	0.006	0.0023	0.002	-0.0155	0.007	0.0009	0.003	0.0070 ***	0.003	-0.0010	.
time	0.0022	0.002	0.0033	0.002	-0.0021	0.003	-0.0003	0.001	-0.0047	0.003	-0.0005	0.001	-0.0005	-0.001	0.0053 *	0.003

Base status is full-time wage and salary employment

Reference categories are: Northeast region, children under age 6 present, male, less than high school education, married spouse not working, white nonHispanic, and native-born citizens.

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