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**The Response of Voluntary and Involuntary  
Female Part-Time Workers  
to Changes in Labor-Market Conditions\***

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**השפעת שינויים בתנאי שוק העבודה על היקף המשרה של נשים: ההבדלים בין עובדות  
במשרה חלקית מרצון ולא מרצון**

תקציר

במחקרים שנערכו בארצות-הברית נמצא כי ההסתברות שעובדות במשרה חלקית האומרות כי הן מעדיפות לעבוד במשרה מלאה (עובדות במשרה חלקית שלא מרצון) יעברו למשרה מלאה גדולה מזו של עובדות במשרה חלקית מרצון. ממצאים אלה נתפסים כעדות לכך שלסיווג הסובייקטיבי של עובדות במשרה חלקית, בהתאם לרצון במשרה כזאת, יש תוכן התנהגותי. בישראל, לעומת זאת, הנטייה של עובדות במשרה חלקית שלא מרצון לעבור למשרה מלאה אינה שונה מזו של אלו העובדות במשרה חלקית מרצון. למרות זאת אנו טוענים כי שיעור המעבר ממשרה חלקית למלאה אינו מבחן ממצה ומציעים מבחן אלטרנטיבי: בחינת ההבדל בין עובדות במשרה חלקית מרצון ולא מרצון בתגובה לשינויים בביקוש לעובדים. אנו משתמשים בראיונות החוזרים בסקרי כוח האדם כדי ליצור בסיס נתונים לתקופה שבין 1991 עד 2004 ומוצאים כי גידול מהיר של התוצר והביקוש לעובדים מגדילים את ההסתברות שנשים העובדות במשרה חלקית שלא מרצון יעברו לתעסוקה מלאה, אך אינם משפיעים על התנהגותן של עובדות במשרה חלקית מרצון. לכן, למרות ששיעור המעברים הכולל למשרה מלאה דומה בשתי הקבוצות, נראה כי לחלוקה הסובייקטיבית של העובדות במשרה חלקית לכאלו המצויות בהיקף משרה זה מרצון או לא בהתאם לרצון יש משמעות לחיזוי התנהגות העובדות על פני מחזור העסקים.

**The Response of Voluntary and Involuntary Female Part-Time  
Workers to Changes in Labor-Market Conditions**

**Adi Brender and Lior Gallo**

**Abstract**

Micro studies in the US find that part-time employees who prefer to work full-time (involuntary part-timers) are more likely to move to full-time employment than those who work part-time voluntarily. These findings are taken as evidence that the subjective classification of involuntary part-timers has a behavioral content. In contrast, the tendency of Israeli involuntary part-timers to move to full-time jobs is similar to that of voluntary ones. Nevertheless, we argue that the raw rate of transition is not a conclusive test and suggest an alternative one: observing the differences in the response of voluntary and involuntary part-timers to changes in labor demand. Using the repeated interviews in Israeli Labor Force Surveys, we create a dataset that covers the period 1991-2004 and find that GDP growth and changes in labor demand increase the probability that involuntary part-timers will move to full-time jobs, but have no effect on voluntary part-timers. Therefore, despite the virtually identical raw transition rates of voluntary and involuntary part-timers, this subjective classification appears to have a significant behavioral content.

## 1. Introduction

Part-time (PT) employees account for a significant share of the female labor force in the developed economies as well as in Israel (OECD, 2007a)<sup>1</sup>. The views about part-time jobs have been mixed. On the one hand, findings that PT workers are paid less and get less benefits and training than full-time (FT) employees led to a concern that PT jobs are "low quality jobs" that provide poor opportunities and working conditions for employees (Blank 1989, Farber, 1999 and references thereof). This view was enhanced by findings that PT jobs are not used as a "stepping stone" to full-time employment by women who enter the labor force (Oreilly and Bothfeld, 2002, Blank 1998). On the other hand, many view the expansion of PT employment as an important mechanism that facilitates the entry of women into the labor force while balancing between household and market production (e.g., OECD, 2007b). Petrongolo (2004) finds that job-satisfaction of women in PT jobs is country dependent: high in northern Europe and low in southern Europe.

One way to approach these contradicting views about PT jobs is to distinguish between employees who work PT willingly and those who work PT involuntarily. PT employees are regularly asked in labor force surveys for the reason they do not work full-time. If they reply that they could not find such a job they are classified as involuntary part-timers (PTs). Therefore, if the subjective statement about the desired hours is credible, then the distinction between voluntary and involuntary PTs could help in the evaluation of this phenomenon: the revealed preferences of voluntary PT employees would suggest that they are better off in their PT job, even if they earn less than FT workers with similar qualities. For involuntary PTs this position is likely to represent a form of underemployment. This perception of involuntary PTs is reflected in their treatment by the Bureau of Labor Statistics in the US, and statistical agencies in other countries, which publish parallel unemployment series that classify them as "partly unemployed". The focus on PT jobs as "low quality" ones has emerged in the late 1980s and in the 1990s, because the share of involuntary PTs has risen substantially in the preceding decade (Tilly, 1996). While the trend rise in the share of involuntary PTs among PT employees was halted in many countries (Buddelmeyer et

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<sup>1</sup> Throughout this paper we define part-time employees as individuals who work regularly less than 35 weekly hours. The only exception is teachers for which we define a full-time job as 24 hours. Sensitivity analyses for this definition is provided in the appendix tables.

al. 2004b), the significant magnitude of the phenomenon keeps the treatment of PT jobs an issue.

Feldman (1990), in his discussion of key questions regarding the rising share of PT employees in the labor force, highlighted the need to examine the behavior of voluntary and involuntary PTs separately. Blank (1994, 1998), also indicates the important role of employee preferences in understanding and predicting the behavior of PT female workers. In her study of a panel of US female PT workers over a 14 years period, she shows that ignoring the individual's past patterns of labor supply may result in poorer predictions of transitions between PT, FT and non-employment and finds that observing current market behavior provides little information regarding next year's behavior. She attributes part of the contribution of the work history to its ability to reflect subjective information about the individual – particularly preferences. Blank states that past patterns of labor supply are important not because they directly affect current choices but because they are correlated with less measurable variables such as preferences and expectations. Additionally, Nakamura and Nakamura (1985) and Eckstein and Wolpin (1989) argue that work experience may affect current behavior by affecting preferences directly. These arguments suggest that direct information about the individuals' preferences may be useful for predicting behavior – provided that the response to the relevant questions is credible.

However, using subjective information as a key variable in the analysis is not the common practice for economists who raise important questions regarding the accuracy of the reported information, its consistency and its ability to predict behavior. Bertrand and Mullainathan (2001) argue that while most economists would agree that the variables that subjective questions attempt to uncover are important, they doubt whether such questions elicit meaningful answers. One of the key problems is the effect of social desirability on answers where respondents want to avoid looking bad in front of the interviewer. Another problem is cognitive dissonance which leads respondents to report (and sometimes even feel) attitudes that are consistent with their behavior<sup>2</sup>. Examining the issue in a measurement-error

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<sup>2</sup> A comprehensive discussion of issues related to the use of subjective questions appears in Sudman et al. (1996).

framework they suggest that subjective variables are suitable for use only as explanatory variables, and even then causality should be interpreted with care.

In the particular issue of PT employment several findings suggest that the interpretation of the subjective classification as being employed PT voluntarily or not should be done cautiously. Cohen et al. (2000) find a strong and negative correlation between the shares of voluntary and involuntary PTs in the Israeli labor force. Such a correlation may imply (although not necessarily prove) that many PT workers simply change the way they classify themselves, rather than change their actual working hours. Stratton (1996) finds that 28 percent of the involuntary female PTs in her sample changed within one year to voluntary PTs<sup>3</sup>. If this is the case than the distinction between voluntary and involuntary PTs may have little behavioral content, notwithstanding its potential reflection of individual preferences. Moreover, if the behavioral content of this self-classification is limited, its credibility as a report of preferences may also be questionable: it may predominantly reflect the way individuals respond to the question due to social norms (e.g., where working is viewed as a value) or in an attempt to reduce dissonance (e.g., saying that they are not looking for a FT job when they believe that their chances to find one are small). A hint for that possibility is Marshall's (2001) finding that there are no differences between female involuntary and voluntary PTs in their satisfaction with the "balance between job and home".

Several studies examined the observed characteristics of voluntary and involuntary PT workers in order to identify the differences and similarities between the two groups. Typically it is found that female voluntary PTs are more similar than involuntary ones to full-time workers, while involuntary PTs are more similar to the unemployed (e.g., Stratton, 1996). Leppel and Clain (1993) find that African-American women are more likely to work PT involuntarily and that involuntary female PTs are characterized by lower education than voluntary ones. They also find that voluntary PTs have more children, particularly young ones, that their spouses have higher levels of education and that they reside in areas with higher union density (which is a proxy for higher

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<sup>3</sup> Farber (1999) reports a similar transition for 21 percent of his sample of both males and females. This figure is very similar to Stratton's which reports that the rate of such transitions for males is about half that of women (13 percent).

wages). Similar findings are reported by Barret and Doiron (2001) who find that female voluntary PTs are very similar in their observed characteristics to FT employees and that higher education and older age (55-69) reduce the probability of involuntary PT employment. These findings suggest that ignoring subjective attitudes and trying to predict individual behavior only by observed variables may be misleading.

The different characteristics of voluntary and involuntary PTs do not provide, however, a satisfactory answer whether they **behave** differently or just evaluate their situation in another way; they only describe the employees in each category (Kalwij & Gregory, 2000). This caveat may be particularly serious with respect to the subjective classification into voluntary and involuntary PT employment because, as suggested by Barret and Doiron (2001), it may reflect the expectations of prospective employees regarding their ability to find full-time jobs. In order to attribute a behavioral content to this definition one needs to examine whether there are differences in what voluntary and involuntary PTs **do**. Specifically, since being an involuntary part-timer implies the presence of demand constraints, differences in the response of PT workers in the two categories to changing market conditions may indicate that there is a behavioral content to that subjective classification.

In this study we combine the approach of Stratton (1996) and Farber (1999), who examine the transitions of voluntary and involuntary PTs to FT employment in micro data, with that of Buddelmeyer et al. (2004a) that focuses on a macro analysis. To do that we use a dataset that extends over 14 years and follows each individual at two points-in-time spread over more than a year. This dataset allows us to examine the dynamic response of individuals to changing labor market conditions and to overcome some of the limitations in previous studies. Specifically, we can test whether voluntary and involuntary PTs respond differently to changes in GDP and in labor demand conditions. The existing literature on transitions from PT employment is discussed in Section 2. In Section 3 we depict our empirical approach and its contribution to the literature. In section 4 we describe the dataset and in Section 5 we portray the construction of the "potential" wage series used in this study. In Section 6 we present the empirical results and Section 7 concludes.

## **2. Studies of transitions from part-time jobs.**

The existing studies of transitions from PT employment can be broadly divided into two categories: macro studies that examine the relationship between PT employment and macroeconomic developments, and micro studies that examine individual transitions between labor market states. We argue that neither approach provides a satisfying answer whether the classification of individuals as being employed PT voluntarily or not has a behavioral content. Unfortunately, studies that examined transitions of PT employees using long panel data (Blank, 1998, Buddelmeyer et al., 2005) do not report whether PT employees were in this position voluntarily.

In a study of the determinants of PT work in the EU Buddelmeyer et al. (2004a) find a weak countercyclical effect on involuntary PT employment of women. Using a panel of 15 countries they report a statistically significant - but small - effect of the output gap on the share of involuntary PTs in total employment of women for the age group 25-49, and an even smaller effect for younger and older females. However, relating these findings to the behavior of involuntary PTs is not straightforward: it is possible that their declining share in total employment reflects entry of unemployed and nonparticipating women to employment, either as FT employees or as voluntary PTs (for non-participants, due to the "discouraged worker" effect). This latter possibility is also consistent with their finding that the business-cycle's effect on the overall share of PT jobs in the employment of women is very weak.

Cohen et al. (2000) used macro data from Israeli Labor Force surveys for 1979-1997 to examine the relationship between involuntary PT employment and unemployment. They found a positive correlation between the unemployment rate and the share of involuntary PTs in total employment, and a negative correlation with the share of voluntary PTs. They also report a relatively stable share of PTs in female employment and a strong negative correlation between the shares of the voluntary and involuntary PTs in total female employment. One interpretation of these findings is that in periods of low unemployment involuntary PTs move to FT while new, "discouraged", workers enter into voluntary PT jobs. This interpretation would be consistent with the self-classification of involuntary PTs as reflecting future behavior. However, the possibility mentioned above that involuntary PTs do not move at all is also consistent with these data. Additionally, it is possible that the correlation between

unemployment and the share of involuntary PT employment reflects changes in what people **say** rather than what they **do**. Suppose that "social desirability" affects the way people respond in the Labor Force Survey and that there is a high value placed on working. In such a case, when market conditions are bad PTs have a good excuse not to work full-time and they may state that they want a full-time job but cannot find one. In contrast, when labor market conditions are favorable this is not a credible excuse, so they have to admit that they are not really interested in working more. Similar arguments can be made with respect to dissonance. As mentioned above, the incidents of shifting from self-classifying the PT status as involuntary to voluntary are quite common. That is, in many cases workers change the stated reason for working PT rather than their employment status. These possibilities highlight the need for micro data to understand the behavioral implications of the involuntary PT employment phenomenon. This line of research is also recommended by Cohen et al. as a follow-up their findings.

Stratton (1996) tested the accuracy of the classification of individuals as involuntary PT employees in the US 1990 Current Population Survey. Using probit equations she showed that the observed characteristics of involuntary PTs are more similar to those of the FT labor force (full-time employees and unemployed persons looking for a full-time job) than the characteristics of the voluntary PTs. Using another probit equation for the probability of actually working full-time (conditional on looking for such a job) she also found that voluntary PTs are more similar to full-time employees than involuntary ones, while the involuntary PTs are more similar to the unemployed. The interpretation of these combined results is that involuntary PTs seek FT jobs but are constrained in finding them. Finally, she examined the transitions of voluntary and involuntary PTs into FT employment over a period of one year and found that the probability of this transition for female involuntary PTs was substantially higher. Stratton interprets these findings as confirming that those classified as involuntary PTs are indeed involuntarily in this status. Farber (1999), in a study of displaced workers in the US, highlights the role of involuntary PT employment as a transitional stage for job losers. He also finds that a higher fraction of involuntary PTs moved to



FT employment, compared to voluntary ones<sup>4</sup>. Euwals (2001) and Euwals et al. (1998) analyze a panel of Dutch women for the years 1987-1989. While they did not look directly at involuntary PT employment, they find that working hours were adjusted in accordance with the gap between desired and actual hours in the previous period.

Comparing the transition rates from involuntary and voluntary PT employment to FT jobs offers a promising avenue to confirm the meaningfulness of this classification. However, this test appears to be one-sided. If the transition rate of involuntary PTs to full-time employment is higher it supports the credibility of their statement that they would like to work full-time. If, on the other hand, there is no such difference it is not necessarily the case that the classification does not reflect the true preferences. One reason why the transition rates among voluntary PTs may be higher is that the personal circumstances that led them to prefer PT jobs may change. If the reason for preferring PT employment is, for example, the presence of a newborn or young child at home, or attending academic studies, then a change in these circumstances may imply a change in preferences as well. Accordingly, the individual would move from voluntary PT employment to FT. A second reason is that although involuntary PTs have a stronger preference for FT employment than voluntary ones, their ability to find such jobs may be lower (e.g., Stratton's findings above). The contrary is true with respect to voluntary PTs. It is not a-priori clear which effect would dominate, especially in periods of weak demand, even if the involuntary PTs classify themselves credibly. A final point is that finding a higher transition rate for involuntary PT workers may not reflect causality. In line with the potential biases suggested by Bertrand and Mullainathan (2001), those who see a high probability of finding a full-time job in the next period may say that they are looking for one, while those who think that their chances are low would reduce dissonance and state that they prefer to work PT.

In the following section we propose a methodology that can combine the advantages of some of the previous studies, while alleviating some of their shortcomings.

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<sup>4</sup> These findings are reported in Table 10 of his study. Farber does not report the separate transition rates for males and females.

### **3. Empirical framework**

The empirical analysis in this study is based on micro data that allow us to identify which individuals, if any, are moving from PT to FT jobs when demand conditions change. Involuntary PT employees are those desiring to work more but constrained by demand conditions<sup>5</sup>. Therefore, this study will compare the transitions of voluntary and involuntary PT employees, as done by Stratton and Farber, but will relate the probability of moving to FT jobs to changes in demand conditions. A positive interaction between being an involuntary PT and improved demand conditions would suggest that weak demand is indeed a constraint for involuntary PT employees in finding FT jobs; the lack of such a relationship would indicate that it is not. To correct for potential modifications of preferences we also control for changes in personal circumstances, such as the birth of a new child, exiting from formal education and changes in the spouse's income.

To obtain sufficient variability in the demand conditions due to macroeconomic developments we pool the Israeli Labor Force Surveys for the period 1991-2004. Within these surveys each individual is interviewed four times over a period of up to 15 months. Using this feature of the surveys we identify those who worked part-time in their first interview and combine their data with that of their last interview. We repeat this procedure for each year in the dataset to obtain a sample of 18,979 women who worked part-time in their first interview. Of these, 3,817 were classified as involuntary PTs<sup>6</sup>. With this sample we can trace changes in the employment status as well as in individual and household characteristics.

We draw on two variables to account for variations in the demand conditions faced by workers. First we use the change in real GDP between the first and last interviews of the individual. This variable has the advantage of reflecting the changes in economic activity precisely between the quarters in which the two interviews were conducted, but has the disadvantage of not accounting for changes in the demand for labor in specific groups. To account for that, we estimate the changes in the employees' "potential" wage between her first and last observations. This variable is calculated

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<sup>5</sup> This classification is consistent with the findings of Barret and Doiron (2001) and Leppel and Clain (1993) who point-out demand conditions as the key constraint for job expansion by involuntary PTs.

<sup>6</sup> The construction of the dataset is described in details in Section 4.

from wage equations, estimated using the Israeli Incomes Survey, and by applying their coefficients to the characteristics of the individuals in the Labor Force Surveys<sup>7</sup>. This change is a proxy for the change in labor market conditions facing the individual due to changes in the relative "price" of her characteristics, caused by asymmetries in the demand for employees with different qualities, to macroeconomic developments and to changes in the relevant tax rates. "Potential" wage variations may also reflect changes in personal characteristics, but since such changes could also affect directly the decision to move from PT employment to FT we control for them separately in the transition equations.

The use of "potential" wages, estimated from the Incomes Surveys, rather than the individuals' actual wages (which are not available in the LFS) removes the problem of endogeneity in the individual wage setting – e.g., a higher wage offer in response to expanding the working hours, due to fixed costs of employment. Moreover, using the entire female working population in the estimation of the wage equations, and not only PT employees, also mitigates considerably the probability of coordinated supply shocks of PTs affecting the estimated wage<sup>8</sup>. However, to further account for the possibility of coordinated supply shocks, we control in our transition equations for potential attributes that could be related with such a coordinated move – immigrant status, family structure and being a student<sup>9</sup>.

The empirical estimation is based on the following logit equation:

$$PR(FT_{t+1} | (PT_t, EMP_{t+1})) = \alpha + \beta_1 * IV_t + \beta_2 * \Delta W * IV_t + \beta_3 * \Delta GDP * IV_t + \\ + \beta_4 * \Delta W * V_t + \beta_5 * \Delta GDP * V_t + \beta_6 * \Delta Z + \beta_7 * Z_t + \varepsilon$$

The dependent variable is the probability of moving from PT employment in period t to FT employment in period t+1, conditional on working in the second period.

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<sup>7</sup> The detailed description of the "potential" wage calculations appears in Section 5. This method was previously used by Brender et al. (2002) and by Brender and Strawczynski (2006).

<sup>8</sup> In the current setting entries into, and exits from, employment are demand shocks from the point-of-view of the individuals in our sample - PT employees who already worked in the first period and continued to work in the second.

<sup>9</sup> Consider, e.g., the hypothetical possibility that immigrants want to move from PT employment to FT and that this increased supply lowers their hourly wages. In such a case a simple correlation would capture a negative relationship between moving to FT jobs and changes in the hourly wage. However, once we control for the immigrants' status this negative correlation should disappear.

The first RHS variable,  $IV_t$ , is a binary variable for involuntary PT employees in the first period. The next four expressions include interactions of the change in the "potential" wage and GDP with binary variables for each of the two classes of PT employees in the first period - involuntary or voluntary, respectively. This division is intended to allow for a different effect of changes in the demand conditions according to the individual's preferences. The following expression represents a vector of changes in personal characteristics such as the birth on a new child, leaving school, the youngest child reaching the mandatory schooling age and changes in the spouse's income. This vector is intended to control for changes in those characteristics that may influence the individual's preferences for working PT. Finally, the last two expressions represent a vector of personal characteristics that may affect the preference to work PT and an error term. Although our analysis includes the subjective statement regarding the preference to work PT, it is likely that differences in the strength of this preference between individuals exist; the personal and family characteristics in this vector are intended to capture some of this difference. We also calculate and control for the propensities to work PT voluntarily (conditional on working), to work FT (conditional on seeking FT employment) and to want a FT job.

The empirical design of this study also alleviates the potential bias in responses of individuals with respect to their preferences. As suggested above, individuals may change their responses regarding their preference to work FT in positive correlation with their probability to find such a job. This creates a spurious positive correlation between being classified as an involuntary PT and moving to a full-time position in the following period. The current study is examining the correlation between these transitions and demand conditions conditional on the PT classification, so for the same bias to occur the respondents would also have to accurately predict the change in demand conditions during the next year.

#### **4. The dataset**

The dataset used in this study is based on the repeated interviews in the Israeli Labor Force Surveys (LFS) conducted by the Central Bureau of Statistics (CBS). In these surveys each household is interviewed 4 times: the second interview is conducted 3 months after the first one, the third 6 months after the second and the final interview

takes place 3 months after the third. Although the CBS does not provide the pooled data for each individual we follow Stier (1998), Beenstock & Klinov (1998) and Brender & Strawczynski (2006) and use an algorithm that identifies the interviews of individuals. We drop from our sample individuals that were not interviewed at least 3 times. The remaining sample allows us to follow each individual for a period of about one year and to trace changes in their personal characteristics and in their labor market status (as well as in the characteristics and employment status of their spouses). To allow for sufficient variability in the macroeconomic environment we merge the LFS for the period 1991-2004. We restrict our sample to the age groups 22-69 to avoid the problems associated with the way the CBS reports labor market data for the population in military duty age<sup>10</sup>.

The selection process is described in Table 1. In the first stage we find 18,979 women who worked PT in the first two interviews and had data on all the relevant variables. Since our data allow us to calculate "potential" wage changes only for a full year period, and because we want to relate the transitions from PT to FT employment (or out of employment) to changes in that variable, we drop from the sample women who worked PT in their first interview and worked FT or did not work in the second (3 months later)<sup>11</sup>. Of these 18,979 women we are able to trace 14,283 with at least one interview after the six-month break. The distribution of the lost observations over the years is provided in Table 2 and shows that the loss rate was quite stable at 22 percent with the exception of 1994, when the CBS changed the sampling process. The loss rate is lower than that reported by Startton (1996), Bound and Kruger (1991) and Card (1991) who used similar techniques on US surveys. Of the 14,283 observations for which we were able to match data 2,165 had to be dropped because they did not work at all in the later period.<sup>12</sup> This leaves us with 12,118 available observations for the analysis of transitions conditional on being employed.

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<sup>10</sup> Jewish women in Israel are subject to a mandatory two years service between the ages of 18 and 20, and a majority of them actually serve. A substantial number of women also extend their service by one year.

<sup>11</sup> At this stage, which preceded the identification of the initial 18,979 observations, we lose 4,416 observation, of which 962 are involuntary PTs – a similar proportion to their share in the remaining sample. 2,713 of these women moved to FT jobs and 1,703 stopped working.

<sup>12</sup> We utilize these observations in the analysis of the probability to stop working.

**Table 1: Selection Process to the Final Sample**

<b>Part-time employees in the first period<sup>1</sup></b>	<b>18,979</b>
Not identified in the second period	4,696
<b>Identified in the second period</b>	<b>14,283</b>
Did not work in the second period	2,165
Worked in the second period	12,118
<b>Final sample</b>	<b>12,118</b>
Voluntary part-time in the first period	9,612
Involuntary part-time in the first period	2,506

<sup>1</sup> Individuals who worked part-time in their first interview, did not move to full-time or out of employment in the second interview and had data for the relevant variables.

**Table 2: Sample Distribution**

Year	Part-time employment in the first period	Not identified in the second period <sup>1</sup>	Identified in the second period	Stayed in the sample
				Percent
Number of individuals				
	(1)	(2)	(3)	(3)/(1)
1991	1,498	326	1,172	78.2
1992	1,164	267	897	77.1
1993	1,199	339	860	71.7
1994	1,279	634	645	50.4
1995	1,555	352	1,203	77.4
1996	1,306	321	985	75.4
1997	1,188	253	935	78.7
1998	1,315	257	1,058	80.5
1999	1,368	294	1,074	78.5
2000	1,409	397	1,012	71.8
2001	1,396	296	1,100	78.8
2002	1,437	327	1,110	77.2
2003	1,397	310	1,087	77.8
2004	1,468	323	1,145	78.0
<b>Total</b>	<b>18,979</b>	<b>4,696</b>	<b>14,283</b>	<b>75.3</b>

<sup>1</sup> The second period is defined as the 3<sup>rd</sup> and the 4<sup>th</sup> interviews which are conducted after the six-months break.

A comparison of the characteristics of the "retained" observations to those of the "dropped" ones is reported in Table 3. Generally we do not observe any unexpected

biases in the selection process. However, because the survey is based on a sample of apartments we do find a higher share of dropped observations among the youngest population, new immigrants and women with no children. These groups are characterized by a higher probability to change their place of residence. In terms of working hours there are no significant differences between the two groups, and the difference in the hourly wage is accounted for by the characteristics of the dropped group (young, immigrants). In the empirical analysis below we control for the age, immigration status and motherhood in order to account for the potential bias due to the different loss rates of these groups. The differences in the retention rates between voluntary and involuntary PTs are small.

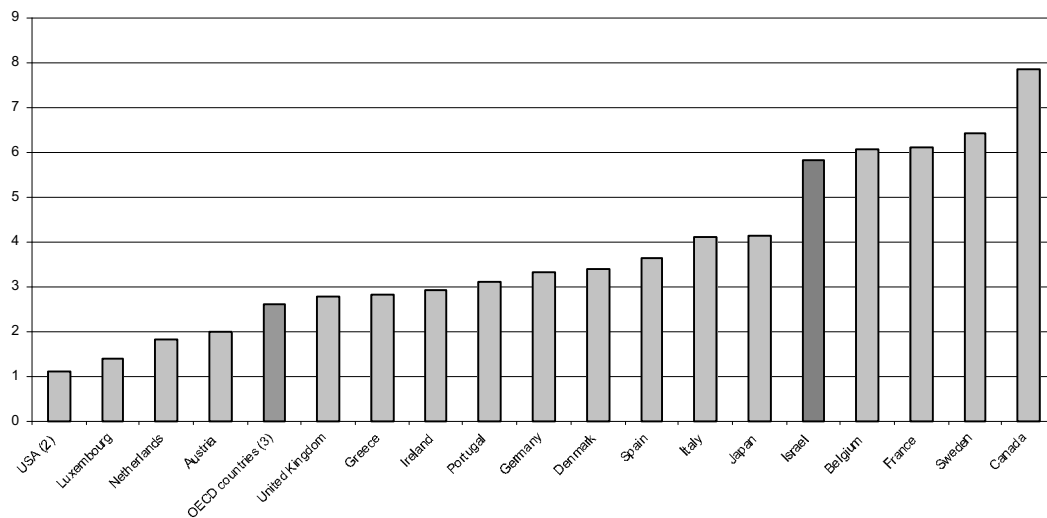
**Table 3: Comparative Characteristics of the Retained and Dropped Observations (percent)**

	Retained	Dropped	Total	Of which:	
				Involuntary part-time	Voluntary part-time
Age 22-25	7.6	15.8	9.6	9.1	9.7
Age 26-30	11.1	16.4	12.4	13.6	12.1
Age 31-40	28.5	26.8	28.1	26.4	28.5
Age 41-50	29.1	21.2	27.2	30.7	26.3
Age 51-60	18.5	11.9	16.9	18.3	16.5
Age 61-65	3.9	4.5	4.1	1.6	4.7
Age 66-70	1.3	3.4	1.8	0.3	2.2
0-8 years of schooling	8.5	7.2	8.2	9.2	8.0
9-10 years of schooling	7.0	6.4	6.9	9.1	6.3
11-12 years of schooling	28.6	25.2	27.8	32.1	26.7
13-15 years of schooling	28.2	34.0	29.7	28.4	30.0
16+ years of schooling	27.6	26.8	27.4	21.2	29.0
Arab	2.6	1.8	2.4	4.4	1.9
New immigrant (less than 15 years)	12.0	15.8	13.0	27.6	9.3
Ultra-orthodox	5.9	2.9	5.2	5.0	5.2
Married	78.2	64.8	74.9	68.9	76.4
Single / Divorced / Widow	21.8	35.2	25.1	31.1	23.6
No Children	40.2	52.2	43.1	46.7	42.3
Mother to 1 or 2 children	39.4	33.9	38.0	40.4	37.4
Mother to 3 or more children	20.4	13.9	18.8	12.9	20.3
Involuntary part-time	20.6	18.5	20.1	100.0	0.0
Voluntary part-time	79.4	81.5	79.9	0.0	100.0
Average weekly hours	22.3	21.9	22.2	21.4	22.4
Average hourly potential real wage	32.1	30.1	31.6	28.1	32.4

In the two right-hand columns of Table 3 we compare the characteristics of voluntary and involuntary PT workers. The age distribution of the two groups is quite similar

with the exception that there are very few involuntary PTs over the age of 60. The education level of involuntary PTs is lower on average than that of voluntary ones and there is also a higher proportion of Arab women and new immigrants among the involuntary PTs. We also find that the average working hours are quite similar in the two groups but that the "potential wage" of the voluntary PTs is higher, consistent with the characteristics mentioned above. In Table A-1 (Equation 1) we calculate the propensity to work PT voluntarily (conditional on working) and find that it is also positively associated with being a student, with the number of children – especially young ones – and with belonging to an ultra-orthodox family. In contrast, single mothers and women at pre-pension ages have a lower tendency to work PT voluntarily. An international comparison suggests that the share of involuntary PTs in female employment in Israel is relatively high (Figure 1).

**Figure 1: The Share of Involuntary Part-Time Workers in Total Female Employment: Israel and Selected OECD Countries<sup>1</sup> (1994-2004)**



<sup>1</sup>Based on the 30 hours criterion. Data are from the OECD statistical portal.

<sup>2</sup>Data for the USA are for the years 1998-2004, inclusive

<sup>3</sup>Weighted average of all OECD countries



In Table 4 we separate the two forces that affect the PT status of an individual: the desire to work FT and being constrained in finding such a job. We find that the characteristics of involuntary PTs are consistent with a higher desire for FT employment and with a more limited ability to find one. Column 1 examines the differences in the propensity of voluntary and involuntary PTs to want a full-time job. These propensities were calculated from logit equations that were estimated for the probability that an individual would look for a full-time job rather than a PT one (the involuntary PTs were omitted from that estimation)<sup>13</sup>. We find that the propensity of involuntary PTs to want a FT job is similar to that of those in the FT labor force and substantially different from that of the voluntary PTs. In Column 2 we show that voluntary PTs appear to be the least constrained in their ability to find a FT job if they want one; their propensity to find FT employment is even larger than that of FT employees. The propensity of involuntary PTs to find FT jobs is between that of FT employees and that of the unemployed<sup>14</sup>.

**Table 4: Propensities to Want and to Achieve Full Time Employment**

	Predicted Probability of Preferring Full-Time Employment <sup>1</sup>	Predicted Full-Time Employment Probability <sup>2</sup>
	(1)	(2)
Full-time employees	71.1	90.8
Unemployed seeking full-time jobs		87.2
Voluntary Part-Timers	62.1	92.3
Involuntary Part-Timers	70.5	89.5

<sup>1</sup> The propensities were predicted based on the coefficients of a Logit regression where the dependent variable was belonging to the full-time labor force (unemployed women seeking full-time employment and full-time employees) or to the part-time labor force (unemployed individuals seeking part-time employment and those employed part-time voluntarily). The detailed equation appears in Table A-1 (Equation 2).

<sup>2</sup> The propensities were calculated using the coefficients of a Logit regression in which the dependent variable was "being employed full-time", given that the individual belongs to the full-time labor force. The detailed equation appears in Table A-1 (Equation 3).

<sup>13</sup> In Table A-1 (Equation 2) we find that this probability is decreasing with the number of children, especially those under the age of 5, for students and for women at the pension age. The probability is especially high for new immigrants.

<sup>14</sup> The most noticeable result in Equation 3 of Table A-1 is the large negative coefficient for new-immigrants. That is, the chances of a new immigrant to find a full-time job when looking for one is much lower than that of other women. We also find the expected positive correlation between the level of education and being able to find a full-time job.

## 5. "Potential" wage estimation

To account for changes in the demand conditions faced by individual workers we estimate "potential" wage equations for each year. These equations are estimated using the Israeli Incomes Survey by running a set of individual characteristics on the gross hourly wages of all the female employees in the relevant age group (22-69)<sup>15</sup>. The coefficients of these equations are then applied to the characteristics of the individuals in the LFS to obtain the predicted hourly salaries of the employees. This calculation is repeated for the data from the last interview of the employee, based on the wage equation of the next year. A summary of the wage equations' coefficients is reported in Table A-2. All the coefficients are significant in almost all the years and their signs and size appear to be consistent with expectations. The most noticeable changes in the coefficients over time are the increasing premium for high education during the 1990s, the substantial improvement in the relative position of new immigrants as their tenure in Israel increases, and the deterioration in the relative position of Arab women<sup>16</sup>.

A comparison of the predicted wages in the LFS to the actual hourly wages of PT employees in the Incomes Surveys in each year reveals small differences in the order of 3 to 5 percent. The differences are very stable, indicating that the estimated "potential" wages provide a reasonable approximation for the actual wages of the employees. There are two years in which the gaps are larger: 1991 - a year of mass immigration, and 2003 – a year of severe economic crisis. In our empirical work below we verify that the larger prediction error in these two years does not drive our results. The stability of the ratio of predicted to actual wages is consistent with Cohen et al. (2000) who report that the ratio of hourly wages of female part-time employees to that of full-time ones was stable between 1979 and 1997 (as well as between 1991 and 1997 when they also use an alternative definition). This finding implies that the change in wages derived from the parameters of the entire population in the Incomes Surveys is a good proxy for the change in the salaries of PT employees (see also footnote 22).

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<sup>15</sup> Excluded from the estimation are workers with reported hourly wages which are below 50 percent of the minimum wage or more than 3 standard deviations above the average wage.

<sup>16</sup> For comparison purposes the coefficients should be divided by the average wage in each period.

To transform the gross "potential" wage to a net basis, we multiply the hourly wages by the number of hours worked by that person in the first period to obtain the gross salary. We then apply the relevant tax rates (including income taxes, social security contributions and the health tax) to this salary, taking account of personal tax exemptions and tax credits for children and new immigrants. Finally, we divide the result by the same number of hours to find the net hourly wage. The net wage for the last interview is calculated using the working hours in the **first** interview. The final stage is to calculate the real change in the net hourly wage between the two interviews by dividing the ratio of the wages by the change in the CPI.

## 6. Results

In Table 5 we examine the changes in the employment status of PTs in the way it was done by Stratton (1996) and Farber (1999). These transitions are reported for the full sample of PTs, including those who stopped working after the second interview. We find very little difference in the behavior of voluntary and involuntary PTs: 21.2 percent of the voluntary PTs move to FT employment compared to 20.4 percent of the involuntary ones. Similarly, the proportion of those who stopped working is about 14 percent in both groups. Where we do find a difference is in the way they classify themselves: 32 percent of those who said that they worked PT involuntarily in the first period changed their stated reason for working PT in a way that their PT status changed to voluntary<sup>17</sup>. Additionally, among those who were initially involuntary PTs and stopped working 38 percent were classified as unemployed compared to only 18 percent of the parallel group of voluntary PTs. Therefore, in terms of the test set by Stratton, the classification of Israeli PTs into voluntary and involuntary appears to have a very limited behavioral content.

**Table 5: Transitions from Part-Time Jobs (percent)**

	Out of Labor Force	Unemployment	Involuntary part-time	Voluntary part-time	Full-time
All Part-Timers	10.6	3.0	12.2	53.2	21.0
Voluntary Part-Timers	11.1	2.4	6.7	58.7	21.2
Involuntary Part-Timers	8.7	5.4	33.6	32.0	20.4

<sup>17</sup> Only 16 percent of this latter group (5 percent of all the involuntary PTs in the first interview) either gave birth to a child, entered school or reached the pension age.

In Table 6 we present the results of the logit equations that examine the probability of moving from a PT position to FT, provided that the women continued to work in the second period. To prevent a dominant effect on the results by individuals with large predicted changes in their "potential" wages we exclude the observations with predicted changes of more than 30 percent (in absolute value). These observations account for 4 percent of the sample. To maintain a fixed sample we also exclude these observations from the equation that do not include the "potential" wage<sup>18</sup>.

In Equation 1 we verify the main result of Table 5: there is essentially no difference between voluntary and involuntary PTs in their transitions from PT status to FT. In Equation 2 we find that this result is robust to the inclusion of a binary variable for immigrants in the massive immigration period of 1991-1995<sup>19</sup>. In Equation 3 we show that the lack of difference persists when we control for the changes in individual characteristics that took place between the two interviews. We do find that leaving college or the university, or changing employment from the public sector to the private sector, are associated with a higher probability for such a change. We also find that an increase in the "potential" income of the husband between the two interviews is associated with a *higher* probability of moving to a full-time job<sup>20</sup>. However, even when all these effects are accounted for there is still no significant difference between voluntary and involuntary PTs in the probability of moving to a FT job<sup>21</sup>.

In Equation 4 we add controls for various individual characteristics. We find that older women, especially those at the pension age, are less likely to move from PT to FT. We also find that single women and new immigrants are more likely to move to FT position and that, for mothers, the larger the number of children, especially those under the age of 5; the less likely they are to move to FT employment. We also find that, once we control for the number of children and their ages, the birth of a new child between the two interviews significantly reduces the probability of moving to FT position. Finally we find that whether the husband is employed or not has no effect on the probability of moving to FT but that given a working spouse this probability is

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<sup>18</sup> Estimating the equations with these observations had no qualitative effect on the results.

<sup>19</sup> This variable is intended to control for the adjustment process of new-immigrants whose ability to work FT in the period immediately following their arrival is constrained by their special circumstances.

<sup>20</sup> This counter-intuitive result probably reflects the effects of changing conditions in the specific labor market of the individual which dominate the negative income effect.

<sup>21</sup> We also tested whether the transitions of women whose youngest child reached the age of 5 were affected by it, but found no statistically significant effect.

positively related to the share of the couple's income earned by the women. That is, earning a larger share of the joint income increases the likelihood that couples will make the required adjustments to allow the wife to move to a full-time job. Nevertheless, the addition of these variables does not alter the finding that being an involuntary PT does not increase the probability of moving to FT employment.

**Table 6: The Effect of Part-Time Classification and Personal Characteristics on Transition from Part-Time to Full-Time Employment**

	(1)		(2)		(3)		(4)	
	coefficient	p value	coefficient	p value	coefficient	p value	coefficient	p value
Involuntary part-time	0.021	0.703	0.001	0.983	0.064	0.250	-0.067	0.250
New immigrant in the years 91 and 95 <sup>1</sup>			0.437	0.004				
New child was born					-0.078	0.338	-0.249	0.004
Stopped working at the public sector					0.193	0.003	0.212	0.001
Stopped being a student					0.888	0.000	1.338	0.000
Change in Spouse's potential wage					0.609	0.000	0.515	0.000
Age							-0.027	0.000
Individual at pension age							-0.691	0.000
Student							-0.807	0.000
Single <sup>2</sup>							0.335	0.000
Number of children							-0.040	0.040
Number of children at age 1-4							-0.205	0.000
New immigrant (less than 15 years in Israel)							0.212	0.004
16+ years of schooling							0.146	0.004
Interaction of share in the household "potential" income and spouse employed							0.341	0.001
Spouse employed							-0.006	0.910
Constant							-0.165	0.269
Pseudo R	0.000		0.001		0.010		0.032	
Chi test	0.145		8.039		129.997		397.318	
Observations	11,617		11,617		11,617		11,617	

<sup>1</sup> Individuals who immigrated to Israel in the mass-migration period of 1989-1995. The variable receives a value of 1 only in the years 1991-1995.

<sup>2</sup> Not including divorced or widow.

The examination of simple transition matrices may be misleading, however, as discussed above. In Table 7 we examine the differences in the response of voluntary and involuntary PTs to changes in GDP and in the "potential" wage. To do that we create interaction variables of the change in GDP between the first and last interviews of the individual with two binary variables: for voluntary and involuntary PTs. In Equation 1 we find that GDP growth has a significant and positive effect on the

transition of involuntary PTs to FT while the effect on voluntary PTs is not statistically significant and negative. In Equation 2 we add the controls for personal characteristics and for the changes in them, to find that this key relationship is not affected.

In Equation 3 we include interactions of the change in the "potential" wage with the binary variables for the PT status. We find that the inclusion of these variables lowers the impact of GDP growth on the transitions to FT, but it remains statistically significant<sup>22</sup>. Moreover, the "potential" wage itself has an additional impact in the same direction<sup>23</sup>. This incremental effect indicates that there are idiosyncratic effects on the demand for labor, and growth does not affect all employees in a symmetric way. In Equation 4 we remove the interactions of GDP with the PT classification and find that the effect of changes in the "potential" wage on transitions to FT employment is still significant only for involuntary PTs. Finally, in Equation 5 we estimate Equation 3 with year fixed-effects and find that their inclusion does not qualitatively alter any of our results.

To account for potential biases in our sample selection we conduct a few additional robustness checks whose detailed results are reported in the appendix tables. In Table A-3 we add to the sample teachers that work less than 35 weekly hours (as PTs) and re-estimate Equations 2, 3 and 4. In Table A-4 we re-estimate these equations in a sample that excludes the PTs who report that their jobs are considered to be full-time. In Table A-5 we estimate Equation 3 of Table 7 in two additional versions: (1) in a sample that excludes women over the age of 60 (Equation 1) and, (2) with and triple interaction between the change in GDP, the PT classification and being a new immigrant (Equation 2). Our results are robust to all these tests.

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<sup>22</sup> It could be argued that the change in the "potential" wage, calculated based on the changes of FT employees, is an excessive measure for the changes in the wages of PTs during the same period (because they work less hours). To account for this possibility we added a triple interaction of the PT status, the change in the "potential" wage and the individual's working hours in the first period. If the argument is correct this interaction should be positive. However, it was not statistically significant and did not affect the coefficient of the original "potential" wage interaction.

<sup>23</sup> These equations were also estimated without the data for 1991 and 2003 with no qualitative effect on the results.

**Table 7: The Effect of Changes in Labor-Market and Demand Conditions on Transitions to Full-Time Employment**

	(1)		(2)		(3)		(4)		(5) <sup>1</sup>	
	coefficient	p_value	coefficient	p_value	coefficient	p_value	coefficient	p_value	coefficient	p_value
Involuntary part-time	-0.031	0.600	-0.119	0.058	-0.188	0.004	-0.144	0.022	-0.204	0.002
Interaction of change in GDP with involuntary part-time	4.454	0.024	4.451	0.026	3.994	0.047			4.186	0.041
Interaction of change in GDP with voluntary part-time	-1.106	0.268	-1.082	0.285	-1.029	0.310			-0.966	0.366
Ineraction of change in potential wage with involuntary part-time					2.141	0.000	2.200	0.000	2.349	0.000
Ineraction of change in potential wage with voluntary part-time					-0.259	0.449	-0.281	0.409	0.014	0.971
New child was born			-0.250	0.004	-0.250	0.004	-0.249	0.004	-0.234	0.008
Stopped working at the public sector			0.214	0.001	0.211	0.002	0.210	0.002	0.503	0.000
Stopped being a student			1.339	0.000	1.335	0.000	1.334	0.000	1.341	0.000
Change in Spouse's potential wage			0.514	0.000	0.512	0.000	0.513	0.000	0.540	0.000
Age			-0.027	0.000	-0.027	0.000	-0.027	0.000	-0.027	0.000
Individual at pension age			-0.690	0.000	-0.690	0.000	-0.691	0.000	-0.685	0.000
Student			-0.810	0.000	-0.805	0.000	-0.802	0.000	-0.832	0.000
Single			0.337	0.000	0.339	0.000	0.338	0.000	0.327	0.001
Number of children			-0.040	0.041	-0.040	0.042	-0.040	0.041	-0.042	0.032
Number of children at age 1-4			-0.206	0.000	-0.205	0.000	-0.204	0.000	-0.206	0.000
New immigrant (less then 15 years in Israel)			0.210	0.004	0.196	0.008	0.198	0.007	0.143	0.055
16+ years of schooling			0.146	0.004	0.144	0.005	0.143	0.005	0.138	0.007
Ineraction of share in the household "potential" income and spouse employed			0.342	0.001	0.354	0.001	0.354	0.001	0.363	0.001
Spouse employed			-0.005	0.931	-0.005	0.931	-0.006	0.913	0.010	0.850
Constant			-0.156	0.299	-0.159	0.295	-0.168	0.268	-0.516	0.011
Pseudo R	0.001		0.032		0.034		0.033		0.036	
Chi test	6.456		403.411		419.721		414.711		451.851	
Observations	11,617		11,617		11,617		11,617		11,617	

<sup>1</sup> Estimated with year fixed effects.

In Table 8 we examine the effect of three calculated propensities on the probability to move to a full-time job. Equation 1 reports the results when we include the propensity of individuals to work PT voluntarily. This propensity was calculated by estimating logit equations for the probability to work PT voluntarily using data on all the working women in the sample (PT and FT). The predicted probabilities were then used in the logit equations. The inclusion of this variable reflects, to some extent, the observable factors that affect the tendency to work PT, while the binary variable for the PT classification as voluntary or not reflects the unobservable effects. Not surprisingly we find that the higher propensity to work PT has a significantly negative effect on the probability to move to FT employment. However, the inclusion of this variable does not change qualitatively any of the other results, including the direct negative effect of being an involuntary part-timer<sup>24</sup>.

In Equation 2 we add the propensity to seek FT employment. This propensity was calculated using a Logit regression where the dependent variable was belonging to the full-time labor force (unemployed women seeking FT employment and FT employees). The alternative group was the part-time labor force (unemployed individuals seeking part-time employment and those employed part-time voluntarily). Involuntary part-timers were omitted from the sample. In Equation 3 we include the propensity to find a full-time job conditional on looking for one. Finally, in Equation 4 we combine the latter two propensities. The propensities have a significant effect in the expected direction – a desire to work FT and a high ability to find such a job when looking for it increase the probability to move from PT to FT employment. Nevertheless, the inclusion of these propensities does not alter the main results.

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<sup>24</sup> The interaction of this propensity with the change in the "potential" wage or the change in GDP was not statistically significant and did not affect any of the coefficients of interest.



**Table 8: Sensitivity of the Results to the Propensities to Seek Part-Time Employment and to be Constrained in Finding Full-Time Jobs.**

	(1)		(2)		(3)		(4)	
	coefficient	p value	coefficient	p value	coefficient	p value	coefficient	p value
Involuntary part-time	-0.185	0.005	-0.177	0.008	-0.190	0.004	-0.179	0.007
Propensity to be unconstrained in working full-time <sup>1</sup>			3.275	0.000			3.104	0.000
Propensity to want a full-time job <sup>2</sup>					0.825	0.009	0.716	0.025
Propensity to work part-time voluntarily <sup>3</sup>	-0.759	0.005						
Interaction of change in GDP with involuntary part-time	4.003	0.046	4.038	0.044	3.950	0.049	3.996	0.046
Interaction of change in GDP with voluntary part-time	-1.020	0.315	-0.989	0.330	-1.049	0.301	-1.010	0.319
Interaction of change in potential wage with involuntary part-time	2.139	0.000	2.163	0.000	2.137	0.000	2.157	0.000
Interaction of change in potential wage with voluntary part-time	-0.252	0.462	-0.247	0.473	-0.257	0.453	-0.246	0.474
New child was born	-0.235	0.006	-0.267	0.002	-0.229	0.008	-0.247	0.004
Stopped working at the public sector	0.216	0.001	0.201	0.003	0.215	0.001	0.205	0.002
Stopped being a student	1.326	0.000	1.355	0.000	1.311	0.000	1.333	0.000
Change in Spouse's potential wage	0.542	0.000	0.512	0.000	0.523	0.000	0.522	0.000
Age	-0.025	0.000	-0.031	0.000	-0.025	0.000	-0.030	0.000
Individual at pension age	-0.497	0.004	-0.745	0.000	-0.465	0.010	-0.547	0.003
Student	-0.581	0.000	-0.910	0.000	-0.534	0.001	-0.670	0.000
Single	0.289	0.003	0.418	0.000	0.271	0.006	0.353	0.001
Number of children	-0.013	0.549	-0.044	0.025	-0.008	0.734	-0.016	0.488
Number of children at age 1-4	-0.177	0.002	-0.231	0.000	-0.170	0.003	-0.199	0.001
New immigrant (less than 15 years in Israel)	0.106	0.185	0.428	0.000	0.104	0.205	0.336	0.001
16+ years of schooling	0.160	0.002	0.050	0.372	0.151	0.003	0.062	0.275
Interaction of share in the household "potential" income and spouse employed	0.362	0.001	0.319	0.003	0.330	0.002	0.300	0.005
Spouse employed	-0.056	0.330	-0.033	0.551	-0.027	0.625	-0.051	0.356
Constant	-0.038	0.808	-2.967	0.000	-0.821	0.006	-3.391	0.000
Pseudo R	0.034		0.035		0.034		0.035	
Chi test	427.783		434.878		426.540		439.961	
Observations	11,617		11,617		11,617		11,617	

<sup>1</sup> Calculated using Equation 3 in Table A-1.

<sup>2</sup> Calculated using Equation 2 in Table A-1.

<sup>3</sup> Calculated using Equation 1 in Table A-1.

In Table 9 we examine the "other side" of the behavior of PTs: the effect of growth and changes in the "potential" wage on their probability to stop working. We find that voluntary PTs are not affected by the cycle – they stay where they wanted to be in the first place. Involuntary PTs, on the other hand, are less likely to stop working when growth is high. This effect would work to mitigate the counter-cyclical changes in the share of involuntary PTs in periods of high growth; the size of the coefficient is similar to that in equation for transitions to FT, but with the opposite sign. In contrast, the decline in transitions to FT in periods of low growth, found above, would mitigate the decline in the share of involuntary PT employment due to exits from employment in periods of low growth.

**Table 9: The Effect of Changes in Labor-Market and Demand Conditions on Transitions Out of Employment<sup>1</sup>**

	<sup>(1)</sup>		<sup>(2)</sup>	
	coefficient	p_value	coefficient	p_value
Involuntary part-time	-0.054	0.455	-0.025	0.720
Interaction of change in potential wage with involuntary part-time	0.835	0.168		
Interaction of change in potential wage with voluntary part-time	-0.156	0.692		
Interaction of change in GDP with involuntary part-time	-4.675	0.040	-4.576	0.045
Interaction of change in GDP with voluntary part-time	-1.002	0.419	-1.034	0.403
Constant	1.870	0.000	1.855	0.000
Pseudo R		0.066		0.066
Chi test		662.033		659.952
Observations		12,987		12,987

<sup>1</sup> The equations also included controls for demographic and personal characteristics and for changes in them.

## 7. Summary and conclusions

The tendency of Israeli involuntary PTs to move to FT employment is not different from that of voluntary PTs. This does not mean, however, that the subjective classification of involuntary PTs has no behavioral content. In fact, we find that the response of involuntary PTs to cyclical developments in the economy is fully consistent with their subjective statement: when the economy expands and labor market demand conditions improve they move to FT jobs. When the economy is stagnant and labor demand is weak they do not - and they also tend to give-up and stop working completely. We also find that transitions of involuntary PTs to FT employment are significantly affected by changes in their relative position in the labor market, as reflected in the "potential" wage. In contrast, growth and changes in the

"potential" wage do not affect the probability of voluntary PTs to move to FT employment.

The findings suggest that there may be a justification to treat the involuntary PTs as partially unemployed, both in terms of predicting labor supply responses and for purposes of welfare analysis. Their behavior indicates that they are truly demand constrained. As for voluntary PTs, their behavior clearly suggests that they prefer to stay in their current status, given their personal circumstances. In this respect, even if their relative earnings, benefits or promotion prospects are lower than those of parallel FT employees, these outcomes appear to be the result of choice, rather than of market constraints.

The results also shed some light on the macro findings regarding the cyclical changes in the share of involuntary PTs. The similar magnitude of the coefficients of the change in GDP in the equations for moving to FT and in those for stopping to work suggests that the dominant factor affecting the countercyclical changes in the share of PT employment, which was observed in previous studies, does not reflect changes in the outflows from the involuntary PT status. It is more likely to result from changes in the extensive margin: entry of new employees in periods of expansion directly into FT employment and exits of FT employees in periods of slow growth (the discouraged worker effect).

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**Table A-1: Propensity Equations**

	Propensity to work part-time voluntarily <sup>1</sup>		Propensity to want a full-time job <sup>2</sup>		Propensity to work full-time <sup>3</sup>	
	(1) coefficient	p_value	(2) coefficient	p_value	(3) coefficient	p_value
Age	-0.107	0.000	0.125	0.000	0.152	0.000
Age squared	0.002	0.000	-0.002	0.000	-0.002	0.000
Individual at pension age	0.349	0.000	-0.300	0.000	0.993	0.000
dummy for pre-pension age	-0.123	0.005	0.145	0.001	0.378	0.001
Age group 22-25	0.251	0.000	-0.259	0.000	0.053	0.457
0-8 years of schooling	0.436	0.000	-0.573	0.000	-0.543	0.000
9-10 years of schooling	0.250	0.000	-0.346	0.000	-0.306	0.000
13-15 years of schooling	0.429	0.000	-0.981	0.000	0.609	0.000
16+ years of schooling	0.585	0.000	-1.103	0.000	0.774	0.000
Interaction of age with 13-15 years of schooling			0.021	0.000	-0.008	0.104
Interaction of age with 16+ years of schooling			0.020	0.000	-0.010	0.004
Student	1.180	0.000	-1.212	0.000	0.408	0.000
divorced	-0.353	0.000	0.130	0.001	-0.551	0.000
Single	-0.526	0.000	0.489	0.000	-0.433	0.000
single parent	-0.279	0.000	0.037	0.397	-0.007	0.918
Number of children	0.137	0.000	-0.230	0.000	-0.023	0.196
Number of children at age 1-4	0.123	0.000	-0.135	0.000	0.078	0.089
Mother for a new born child	-0.007	0.826	-0.071	0.016	-0.110	0.055
Number of earners in the household	-0.073	0.000	0.084	0.000	-0.064	0.001
New immigrant (less then 15 years in Israel)	-0.854	0.000	0.554	0.000	-0.788	0.000
Old immigrant (more then 15 years)	-0.264	0.000	0.219	0.000	-0.021	0.716
Ultra-Orthodox	0.184	0.000	-0.444	0.000	-0.143	0.254
Arab	-0.241	0.000	0.134	0.022	-0.160	0.072
Ako District	-0.025	0.621	0.020	0.678	-0.407	0.000
Beer Sheva District	-0.130	0.001	0.115	0.001	-0.233	0.000
Haifa District	0.138	0.000	-0.144	0.000	-0.364	0.000
North District	-0.277	0.000	0.281	0.000	-0.129	0.012
Tel Aviv Metropolis District	-0.012	0.594	0.033	0.139	-0.037	0.392
Constant	0.696	0.002	-0.707	0.001	-0.582	0.161
Pseudo R	0.084		0.072		0.054	
Chi test	7182.956		6452.355		1656.013	
Observations	72,783		71,705		48,929	

<sup>1</sup> The equation was calculated using a logit regression in which the dependent variable was "being employed part-time voluntarily" and the alternative was working full-time or part-time involuntarily.

<sup>2</sup> The equation was calculated using a Logit regression where the dependent variable was belonging to the full-time labor force (unemployed women seeking full-time employment and full-time employees). The alternative group was the part-time labor force (unemployed individuals seeking part-time employment and those employed part-time voluntarily). Involuntary part-timers were omitted from the sample.

<sup>3</sup> The equation was calculated using a Logit regression in which the dependent variable was "being employed full-time", given that the individual belongs to the full-time labor force.

**Table A-2: Wage Equations Coefficients<sup>1</sup>**

	1991-1995	1996-2000	2001-2005
Age	0.8	1.3	1.9
Age squared	-0.7	-1.1	-1.5
0-8 years of schooling	-4.7	-7.3	-5.2
9-10 years of schooling	-2.3	-4.6	-4.1
13-15 years of schooling	4.2	8.4	10.0
16+ years of schooling	7.3	15.7	20.1
Spouse's years of schooling	0.4	1.0	1.5
Father's ethnicity - Asia or Africa	-0.5	-1.9	-2.4
Number of children	0.3	0.5	0.9
Arab	-0.3	-2.3	-4.1
Veteran immigrant (more than 15 years in Israel)	-0.3	-2.2	-2.7
Interaction of New immigrant <sup>2</sup> with 13 + years of schooling	-4.9	-8.0	-9.4
Interaction of New immigrant with age	-0.2	-0.5	-0.5
Interaction of New immigrant with tenure in Israel	1.3	1.6	1.2
Number of rooms per capita in the household	1.3	2.9	3.8
Constant	-5.5	-11.8	-23.5
Average annual number of observations	2,840	5,072	6,188
R-squared	0.30	0.33	0.28
Average wage	16.9	30.3	39.4

<sup>1</sup> The reported figures are the simple averages of the annual coefficients in each period. All the coefficients are significant at the 1 percent level. The dependent variable is the hourly wage in current NIS.

<sup>2</sup> New immigrant - less than 15 years in Israel.



**Table A-3: The Effect of Changes in Labor-Market and Demand Conditions on Transitions to Full-Time Employment - an Expanded Sample with Teachers<sup>1</sup>**

	(1)		(2)		(3)	
	coefficient	p value	coefficient	p value	coefficient	p value
Involuntary part-time	-0.146	0.024	-0.215	0.002	-0.175	0.007
Interaction of change in GDP with involuntary part-time	4.552	0.028	4.029	0.052		
Interaction of change in GDP with voluntary part-time	-0.435	0.668	-0.411	0.686		
Interaction of change in potential wage with involuntary part-time			2.235	0.000	2.300	0.000
Interaction of change in potential wage with voluntary part-time			-0.101	0.770	-0.111	0.747
New child was born	-0.425	0.000	-0.427	0.000	-0.425	0.000
Stopped working at the public sector	0.095	0.164	0.089	0.198	0.089	0.196
Stopped being a student	1.200	0.000	1.193	0.000	1.191	0.000
Change in Spouse's potential wage	0.548	0.000	0.542	0.000	0.542	0.000
Age	-0.026	0.000	-0.025	0.000	-0.025	0.000
Individual at pension age	-0.972	0.000	-0.969	0.000	-0.969	0.000
Student	-0.683	0.000	-0.676	0.000	-0.673	0.000
Single	0.362	0.000	0.364	0.000	0.363	0.000
Number of children	-0.062	0.002	-0.061	0.002	-0.061	0.002
Number of children at age 1-4	-0.257	0.000	-0.257	0.000	-0.257	0.000
New immigrant (less than 15 years in Israel)	0.315	0.000	0.301	0.000	0.302	0.000
16+ years of schooling	0.202	0.000	0.200	0.000	0.199	0.000
Interaction of share in the household "potential" income and spouse employed	0.408	0.000	0.423	0.000	0.423	0.000
Spouse employed	0.055	0.326	0.055	0.321	0.055	0.325
Constant	-0.358	0.018	-0.371	0.015	-0.374	0.014
Pseudo R		0.035		0.037		0.036
Chi test		439.528		455.975		452.010
Observation		12,268		12,268		12,268

<sup>1</sup> The sample in this table includes teachers that work less than 35 hours per week as part-time employees.

**Table A-4: The Effect of Changes in Labor-Market and Demand Conditions on Transitions to Full-Time Employment - Excluding Jobs that are Considered to be Full-Time <sup>1</sup>**

		(1)		(2)		(3)	
		coefficient	p_value	coefficient	p_value	coefficient	p_value
Involuntary part-time	inv_part0	0.128	0.068	0.067	0.370	0.118	0.094
Interaction of change in GDP with involuntary part-time	gdp_inv	5.291	0.015	4.792	0.028		
Interaction of change in GDP with voluntary part-time	gdp_tinv	-1.078	0.397	-1.049	0.411		
Interaction of change in potential wage with involuntary part-time	int_per_change_log_net0			2.026	0.001	2.108	0.000
Interaction of change in potential wage with voluntary part-time	int_per_change_log_net0t			-0.105	0.808	-0.130	0.764
New child was born	din_born_child	-0.238	0.023	-0.241	0.021	-0.241	0.022
Stopped working at the public sector	din_outeconpub	0.281	0.000	0.272	0.001	0.271	0.001
Stopped being a student	din_outstudent	1.757	0.000	1.752	0.000	1.751	0.000
Change in Spouse's potential wage	spo_per_change_log_real	0.476	0.000	0.469	0.000	0.471	0.000
Age	age	-0.035	0.000	-0.035	0.000	-0.035	0.000
Individual at pension age	pens_age	-0.479	0.010	-0.478	0.010	-0.477	0.010
Student	student	-0.943	0.000	-0.934	0.000	-0.930	0.000
Single	single	0.254	0.026	0.257	0.024	0.257	0.024
Number of children	num_child	-0.038	0.116	-0.037	0.123	-0.037	0.122
Number of children at age 1-4	nyea4	-0.223	0.001	-0.222	0.001	-0.222	0.001
New immigrant (less than 15 years in Israel)	ole_new	0.256	0.002	0.238	0.004	0.242	0.004
16+ years of schooling	ysc_16	0.032	0.629	0.029	0.663	0.028	0.678
Interaction of share in the household "potential" income and spouse employed	sal_spo	0.228	0.076	0.244	0.058	0.243	0.058
Spouse employed	spo_emp_c	0.048	0.465	0.048	0.467	0.047	0.474
Constant	cons	-0.066	0.712	-0.080	0.662	-0.089	0.624
Pseudo R			0.045		0.046		0.045
Chi test			395.327		407.731		402.167
Observations			8,926		8,926		8,926

<sup>1</sup> The sample in this table includes only women who work less than 35 hours per-week and report that their jobs are considered to be part-time.

**Table A-5: The Effect of Changes in Labor-Market and Demand Conditions on Transitions to Full-Time Employment - Additional Robustness Checks**

	(1) <sup>1</sup>		(2)	
	coefficient	p_value	coefficient	p_value
Involuntary part-time	-0.186	0.005	-0.190	0.004
Interaction of change in GDP with involuntary part-time	4.087	0.043	5.409	0.016
Interaction of change in GDP with voluntary part-time	-1.184	0.250	-1.138	0.278
Interaction of change in GDP with involuntary part-time and new immigrant			-6.424	0.165
Interaction of change in GDP with voluntary part-time and new immigrant			1.606	0.682
Interaction of change in potential wage with involuntary part-time	2.104	0.000	2.184	0.000
Interaction of change in potential wage with voluntary part-time	-0.255	0.465	-0.257	0.451
New child was born	-0.244	0.005	-0.251	0.004
Stopped working at the public sector	0.214	0.002	0.214	0.001
Stopped being a student	1.340	0.000	1.333	0.000
Change in Spouse's potential wage	0.526	0.000	0.510	0.000
Age	-0.027	0.000	-0.027	0.000
Individual at pension age			-0.692	0.000
Student	-0.802	0.000	-0.802	0.000
Single	0.350	0.000	0.338	0.000
Number of children	-0.038	0.052	-0.040	0.043
Number of children at age 1-4	-0.205	0.000	-0.206	0.000
New immigrant (less than 15 years in Israel)	0.221	0.003	0.214	0.006
16+ years of schooling	0.150	0.004	0.144	0.004
Interaction of share in the household "potential" income and spouse employed	0.352	0.001	0.352	0.001
Spouse employed	0.005	0.932	-0.001	0.981
Constant	-0.183	0.230	-0.166	0.274
Pseudo R		0.027		0.034
Chi test		322.047		421.910
Observations		10,976		11,617

<sup>1</sup> Excluding women over the age of 60.