



UNIVERSIDAD DE CHILE  
FACULTAD DE ECONOMÍA Y NEGOCIOS  
ESCUELA DE ECONOMIA Y ADMINISTRACIÓN

---

# **Part-Time and Full-Time Work in Chile: Wage Gap Estimation 1990-2006**

---

SEMINARIO DE TÍTULO para optar al título de  
INGENIERO COMERCIAL MENCIÓN ECONOMÍA

Autor:

IVÁN IGNACIO MATURANA GODOY

Profesor Guía:

SR. TOMÁS RAU BINDER

Santiago, Chile

2009

LA PROPIEDAD INTELECTUAL DE ESTE TRABAJO DE INVESTIGACIÓN  
PERTENECE AL PROFESOR QUE DIRIGIÓ ESTE SEMINARIO

# **Part-Time and Full-Time Work in Chile:**

## **Wage Gap Estimation 1990-2006**

Iván Maturana Godoy

Diciembre 2009

### **Abstract**

En este estudio, se realiza un análisis de la brecha salarial para el periodo comprendido entre 1990 y 2006, utilizando la metodología de Oaxaca-Blinder. Con este propósito se realizaron dos brechas salariales: la diferencia salarial entre hombres y mujeres, tanto para la jornada a tiempo parcial como para tiempo completo, y la diferencia salarial entre trabajadores de jornada parcial y jornada completa, tanto para hombres como para mujeres. La importancia de esto es que así se puede apreciar cuanto de la brecha observada es atribuible a discriminación salarial. También, utilizando el método de vecino más cercano de matching se analizó el efecto de cambiarse desde un trabajo de jornada completa a un trabajo de jornada parcial. Para estos propósitos se utilizó la encuesta CASEN, y el panel CASEN. Se encontró que al descomponer las brechas salariales, la discriminación salarial ha ido en disminución, aunque queda mucho trabajo por hacer si se compara con países industrializados (especialmente países escandinavos). Del matching, se obtuvo que existe un premio al salario al pasar de trabajar jornada completa en 2001 a jornada parcial en el 2006. Para el mismo cambio entre los años 1996 y 2001, sin embargo, se encontró que los estimadores no eran estadísticamente significativos.

## Contents

<b>1</b>	<b>Introduction</b>	<b>4</b>
<b>2</b>	<b>Literature Review</b>	<b>6</b>
<b>3</b>	<b>Methodology</b>	<b>9</b>
3.1	Wage Gap Decomposition . . . . .	9
3.2	Matching . . . . .	11
<b>4</b>	<b>Data</b>	<b>14</b>
4.1	CASEN Survey 1990-2006 . . . . .	14
4.2	CASEN Panel Survey . . . . .	18
<b>5</b>	<b>Results</b>	<b>20</b>
5.1	Men/Women Wage Gap Decomposition . . . . .	20
5.2	Part-Time/Full-Time Wage Gap Decomposition . . . . .	21
5.3	Matching: Pay-Premium or Pay-Penalty . . . . .	22
<b>6</b>	<b>Conclusions</b>	<b>23</b>
<b>A</b>	<b>Figures</b>	<b>29</b>
<b>B</b>	<b>Tables</b>	<b>33</b>

# 1 Introduction

The interest in female labour participation has been increasing throughout the years, especially because there is the belief that female labour participation has desirable effects, both on product and productivity (through more efficient allocation of women's skills).

There is a debate on this topic, where some argue that when women stay at home with their children, they have a positive effect on their psycho-social skills, such as personality traits. This skills have been found to have a significant effect on success in individuals life-cycle<sup>1</sup>. On the other hand, increases in female labour participation has been associated with lower levels of poverty, specially amongst poor women and children. Thus female labour participation has been a source for debate amongst labour economists, and as such literature for this topic is extense.

In Chile, female labour participation is low, compared to more developed countries, and even similar countries from Latin America such as Argentina<sup>2</sup>. Such low level of participation, has increased the concern for increasing it, thus alternative type of work is encouraged. Part-time work, is one of this alternatives. Women can choose this type of work, due to its work hours flexibility, its compatibility with family responsibilities, or simply because it provides an easier access to the workforce.

In industrialized countries, governments have tried to implement new legislation in order to improve part-time status over the past years. Chile is no exception. In 2001, a new labour legislation reform was implemented, where amongst other subjects it recognizes part-time labour. According to it, part-time workers will be those who work until 30 hours weekly<sup>3</sup>. Therefore, this study can help in analyzing the effect this new legislation had on Chile's labour

---

<sup>1</sup>See Borghans, Duckworth, Heckman, and ter Veel (2008)

<sup>2</sup>See Ministerio de Trabajo y Previsión Social (2003)

<sup>3</sup>From here on, individuals who work 30 hours or less weekly, shall be considered part-time workers.

market<sup>4</sup>.

Additionally, there has been a problem in the Chilean labour market, during last years; discrimination. In Chile, racial discrimination is not a big problem like other countries, however, gender and class discrimination are. Gender wage discrimination has been analyzed extensively, however since part-time work is relatively a recent development in Chilean labour market literature for it is scarce.

Therefore, the objective of this work, is to analyze the wage gap, for both full-time and part-time labour. In order to do this, using the Oaxaca-Blinder decomposition methodology, and the CASEN (National Socio-Economic Characteristics) survey for the period 1990-2006, I intend to decompose the wage gap between full-time and part-time for both men and women, and decompose the wage gap between men and women, for both full-time and part-time labour. Finally, using Abadie and Imbens (2002) matching estimators, and CASEN panel survey for 1996-2001-2006, I'll analyze the effect on hourly wages when switching from full-time to part-time work.

This study is organized the following way: section 2 provides some literature review for the Chilean case and the rest of the world, section 3 explains the methodology used for this study, section 4 presents a description of the sample used, section 5 presents the results found, and finally section 6 concludes.

---

<sup>4</sup>For a more detailed review of the new legislation see Cáceres (2007), and Rau(2008).

## 2 Literature Review

As it was said previously, Chilean literature about part-time work is scarce, because it has become a somewhat new development in the Chilean labour market.

Leiva (2000), analyzes part-time work in Chile, using CASEN survey for 1994, in order to determine if it is precarious employment. Taking into account instability, insecurity, and insufficient-income, she concludes that part-time work in Chile for 1994 was indeed a precarious type of employment, and that it is equally precarious for both men and women. It must be taken into account though, that at that time there was no legislation in Chile which recognized part-time employment.

Rau(2008), makes an exhaustive analysis on part-time work in Chile. In it, despite the fact that the current legislation on part-time employment was already in place, he finds evidence to consider part-time employment as precarious employment, using CASEN survey for years 1990, 2000, and 2006. Additionally, using Oaxaca-Blinder decomposition method, he decomposes the wage gap between part-time and full-time workers, for 2006. Such decomposition shows that hourly wage for part-time workers is 27,1% higher than their full-time counterparts.

Discrimination literature in Chile, on the other hand is plenty, though for the purposes of this study only two were considered.

Contreras and Puentes (2000), use the Employment and Unemployment Survey of Universidad de Chile for Greater Santiago, in order to decompose the wage gap between men and women for full-time workers during the 1966-1996 period. They find, that discrimination by gender tends to decrease from the 60s to the 80s, and then reverts for the 90s.

Fuentes, Montero, and Palma (2005), use the CASEN survey for the 1990-2003 period, to analyze the gender wage gap for full-time workers. Their study finds that there is a decrease

in gender discrimination for this period, and that by correcting by selectivity bias<sup>5</sup> the results found increase significantly. For instance, 2003 said correction made discrimination change from 14,7% to 28,2%.

Unlike the Chilean case, part-time work has a vast amount of literature internationally. This is specially true in the cases where part-time work explains most of female labour participation, such as the United Kingdom, the Netherlands, and Australia.

Booth and Wood (2006), use Australian panel data, to see if there is actually a pay-premium associated to those who work part-time. They find that part-time women and men have a pay-premium over their full-time counterparts, and also that there is a wage advantage from shifting into part-time.

Hu and Tjidsens (2003), make a comparative study of the wage gap between part-time and full-time work for the United Kingdom, and the Netherlands. For the purpose of their study, they divide the part-time work into long- and short-part-time. Their results show, that there is discrimination in both countries, out of which the UK had the largest. Though, contrary to the evidence found by Booth and Wood (2006), and Rau(2008), they find that full-time workers have a higher hourly wage than part-time workers.

O'Dorchai, Plasman, and Rycx (2007), use cross country data, to decompose the wage gap between full-time and part-time working men. Their study included an analysis for 6 countries: Belgium, Denmark, Italy, Spain, Ireland and the UK. Like Hu and Tjidsens, they find that full-time workers earn a higher hourly wage than part-time workers. Amongst these countries, the largest coefficient for discrimination was for Ireland, and the United Kingdom, whilst Denmark, after controlling for several characteristics has no discrimination.

Connolly and Gregory (2009), find that for women in the UK, there is a long term pay

---

<sup>5</sup>See Heckman (1979)

penalty when they switch from full-time to part-time work. This penalty, is aggravated by the fact that this switch often comes with an occupational downgrade. This is the opposite found by Booth and Wood, since they find there is a pay premium when switching to part-time work.

### 3 Methodology

#### 3.1 Wage Gap Decomposition

As mentioned before, I plan on decomposing the wage gap between part-time and full-time labour for men, and women, and the wage gap between men and women, for full-time, and part-time workers. To perform this, the Oaxaca-Blinder<sup>6</sup> decomposition for linear regressions methodology was used. First, the following equations were estimated:

$$\log(w_F) = X'_F\beta_F + \varepsilon_F \quad (1)$$

$$\log(w_P) = X'_P\beta_P + \varepsilon_P \quad (2)$$

Where  $\log(w_F)$ , and  $\log(w_P)$  represent the log hourly wage,  $X_F$ , and  $X_P$  represent a characteristics vector for full-time, and part-time workers respectively. The characteristics used are, education, potential experience and its square, dummy variables that control by economic branch in which the individual works, a dummy variable that controls if the individual is married or living with someone, a dummy variable which denotes if the individual is the head of the household, and a dummy variable that denotes if the individual lives in an urban or rural locality. Finally,  $\varepsilon_F$ , and  $\varepsilon_P$  are a error term, for full-time and part-time workers respectively.

Assuming that the expected value for the errors is 0, that is if the following is fulfilled:  $E(\varepsilon_F) = E(\varepsilon_P) = 0$  (assumption when using ordinary least squares), the wage gap decomposition between full-time and part-time workers can be expressed in the following manner:

---

<sup>6</sup>See Oaxaca (1973)

$$\overline{\log(w_P)} - \overline{\log(w_F)} = (\overline{X_P} - \overline{X_F})\widehat{\beta}_F + \overline{X_F}(\widehat{\beta}_P - \widehat{\beta}_F) + (\overline{X_P} - \overline{X_F})(\widehat{\beta}_P - \widehat{\beta}_F) \quad (3)$$

Where  $\overline{X_{Ft}}$ , and  $\overline{X_{Pt}}$  correspond to a vector that contains the averages of the characteristics used for full-time, and part-time.

This is Oaxaca-Blinder's "three-fold decomposition", since the wage gap is divided into three expressions. From a simpler point of view, the gap is decomposed as following:

$$Gap = E + C + I \quad (4)$$

Where E (endowments) represents the endowments part of the gap. This, shows which part of the gap can be explained by the characteristics used. C (coefficients) represents the part of the gap that cannot be explained by the characteristics used. Finally, I (interaction) is the part of the gap that is explained by differences in coefficients, and differences in endowments simultaneously.

However to make interpretation easier, an alternative decomposition can be made. If  $\beta_*$  is a nondiscriminatory coefficient vector, the outcome can be rewritten as follows:

$$\overline{\log(w_P)} - \overline{\log(w_F)} = (\overline{X_P} - \overline{X_F})\widehat{\beta}_* + \overline{X_P}(\widehat{\beta}_P - \widehat{\beta}_*) + \overline{X_F}(\widehat{\beta}_* - \widehat{\beta}_F) \quad (5)$$

Obtaining a "Two-fold decomposition", where:

$$Gap = Q + U \quad (6)$$

With Q being  $(\overline{X_P} - \overline{X_F})\widehat{\beta}_*$ , which is the the part of the gap which is explained by the differences in both groups. And U being  $\overline{X_P}(\widehat{\beta}_P - \widehat{\beta}_*) + \overline{X_F}(\widehat{\beta}_* - \widehat{\beta}_F)$ , which is the unexplained part of the gap and that is often considered as the discrimination effect.

Analogously, the same can be done to decompose the wage gap between men and women, resulting in the following:

$$\overline{\log(w_M)} - \overline{\log(w_W)} = (\overline{X_M} - \overline{X_W})\widehat{\beta}_* + \overline{X_M}(\widehat{\beta}_M - \widehat{\beta}_*) + \overline{X_W}(\widehat{\beta}_* - \widehat{\beta}_W) \quad (7)$$

Where  $\overline{\log(w_M)}$ ,  $\overline{X_M}$ ,  $\overline{\log(w_W)}$ , and  $\overline{X_W}$  represent the average log hourly wage, and a vector that contains the averages of the characteristics, for men and women respectively. These characteristics are the same used for the previous decomposition.

It must be considered, that since we are estimating wage equations there is a selectivity bias present, since wages are observed only when the individual chooses to participate in the labour force. This bias can be adjusted by using Heckman's correction for selectivity bias<sup>7</sup>. Whilst this won't be done, it will be kept in mind the presence of a bias due to selectivity.

### 3.2 Matching

As mentioned, a matching estimator was used to view the effects of switching the work hours on wages. The methodology corresponds to Abadie and Imbens (2002) nearest neighbour

---

<sup>7</sup>See Heckman 1979

estimator, their estimator allows to make matches with replacements, which results in lower bias but in a greater variance.

If  $Y_i(0)$  is the outcome when an individual doesn't take part in the experiment, and  $Y_i(1)$  is the outcome when an individual takes part in the experiment, the treatment effect is simply  $Y_i(1) - Y_i(0)$ . The problem with this is that an individual can only have one of those outcomes and not both. Therefore an estimate for the missing outcome must be obtained. This is easy, as it is only a subtraction of sample means, though this is only true when the treatment is randomized (the treatment is randomly assigned to the individuals). Since this case doesn't fulfill this requirement, we pair each treated individual with a similar non-treated individual.

For this to work, however, the following conditions must be met:

$$\text{i. } Y_i(0), Y_i(1) \perp T \mid X$$

$$\text{ii. } 0 < Pr(T = 1 \mid X) < 1$$

The first condition means that considering the observable characteristics ( $X$ ), the treatment acts like it has been randomized. The second condition states, that every treated individual must have a non-treated counterpart. With both conditions met, it is easy to estimate the effect of the treatment:

$$\widehat{ATE} = \frac{1}{N} \sum_{i=1}^N \{\hat{Y}_i(1) - \hat{Y}_i(0)\} \quad (8)$$

$$\widehat{ATT} = \frac{1}{N_1} \sum_{i \in T_1} \{Y_i(1) - \hat{Y}_i(0)\} \quad (9)$$

$$\widehat{ATC} = \frac{1}{N_0} \sum_{i \in T_0} \{\hat{Y}_i(1) - Y_i(0)\} \quad (10)$$

Equation 6 is the average treatment effect, which represents the effect the treatment has in

the survey; equation 7 is the average treatment of the treated effect, which measures the effect that the treatment has on the treated individuals; finally, equation 8 is the average treatment of the controls effect, which measures the effect that the treatment has on individuals who were not treated (control group).

CASEN panel survey will be used to estimate these effects, for several treatments. I will estimate the effects on hourly wages when changing from full-time work in 2001 to part-time work in 2006, in order to see if there is a pay-penalty, or a pay-premium when switching job hours. Also, the same will be done to analyze if the same happens when switching from full-time in 1996 to part-time in 2001. The controls used for these treatments will be education, gender, age, marital status, a dummy that shows if the individual is head of the household or not, and a dummy variable that shows if the individual lived in a rural or urban locality.

## 4 Data

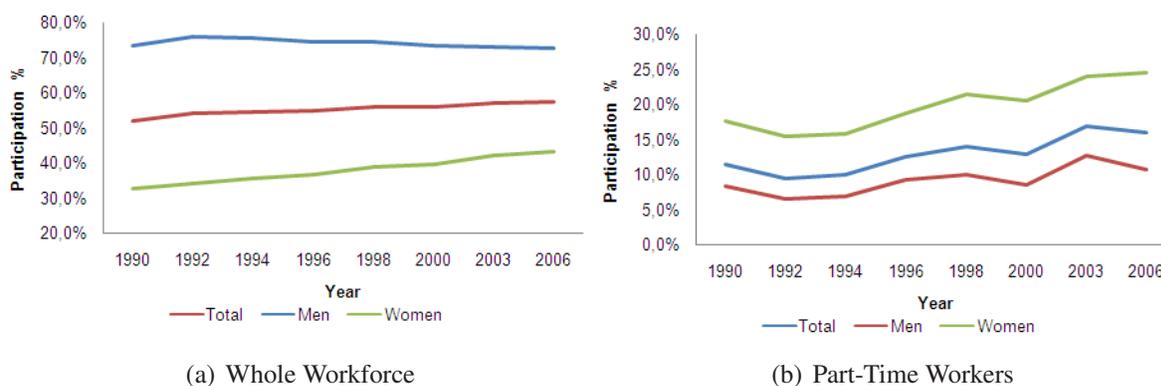
As mentioned, for this study the CASEN survey for years 1990, 1992, 1994, 1996, 1998, 2000, 2003, and 2006 were used to decompose the wage gaps described in section 3. Additionally, also used was the CASEN panel survey for years 1996-2001-2006.

### 4.1 CASEN Survey 1990-2006

The National Socio-Economic Characteristics (CASEN) Survey, realized periodically by the "Ministerio de Planificación" (MIDEPLAN) is representative for the population of Chile, and as such it is an important tool when reviewing the impact of social policies, and understanding the economic and social situation of the population. This section will provide some characteristics of the surveys, and sub-samples used.

Figure 1 shows the labour force participation evolution for men and women. Panel (a) shows participation for men and women considering both full-time and part-time workers, whilst panel (b) shows the labour participation for part-time men and women only.

Figure 1: LABOUR FORCE PARTICIPATION EVOLUTION  
1990-2006



Source: Own calculations based on respective CASEN surveys.

As it can be seen from panel (a), labour participation for women has been increasing since

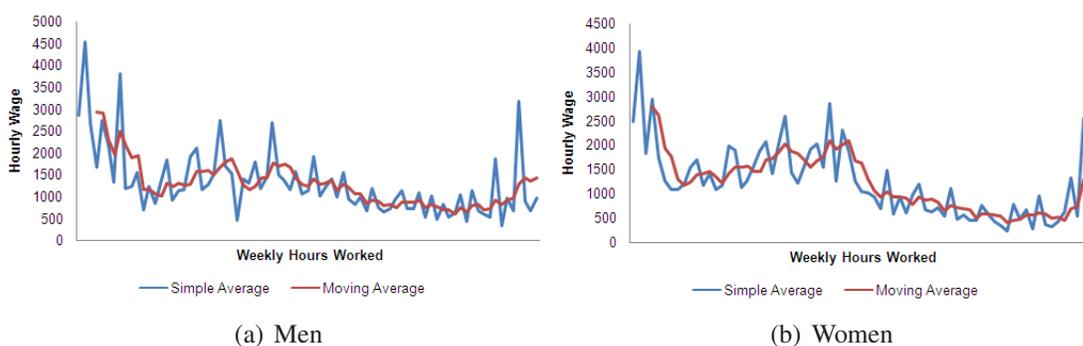
1990, from 32,54% in 1990 to 43,25% in 2006. For men however, since 1990 labour participation has slightly decreased. Panel (b) shows that female participation in part-time labour has increased as well, from 17,60% in 1990 to 24,50% in 2006. Male part-time participation has also seen an upward trend, from 8,42% in 1990 to 10,69%. This explains the increase in part-time labour participation from 11,40% in 1990 to 16,01% in 2006. Tables 1 and 2, show the percentages obtained for every year analyzed.

For the wage gap decomposition a sample of the surveys was used. Only individuals working in the private sector, between the ages of 18 and 65 years old. It is worth mentioning, though, that for years 1990, 1992, 1994, and 1998, no distinction can be made between the private and public sector.

Table 3 shows the amount of individuals contained in each sample, and the percentage they represent of the entire workforce for each year, how much of them are men, and how much of them are women.

Figure 2, shows mean hourly wages by weekly hours worked for 2006, where (a) shows the relationship for men, and (b) shows the relationship for women. Additionally, the red line in both (a) and (b) represents a simple moving average. This was obtained using the sample, and for weekly hours worked between 10 and 90 hours. As it can be seen, as weekly hours worked increases, the mean average for both men and women decreases. There is a slight increase in the mean hourly wage when working between 30 and 35 hours a week, being more noticeable for women. What is interesting is that the mean wage decreases steadily for high hours worked, reflecting that these worker are not being paid "over-time" hours. Booth and Wood (2006), also show this relationship for their study, though for them it is mostly flat, for both men and women, though they also recognize that for high weekly hours worked there is a tendency for mean wages to decrease.

Figure 2: MEAN HOURLY WAGE BY WEEKLY HOURS WORKED  
2006



Source: Own calculations using CASEN 2006 survey.

Source: Sample includes workers from the private sector, with ages between 18 and 65 years, working between 10 and 90 weekly hours.

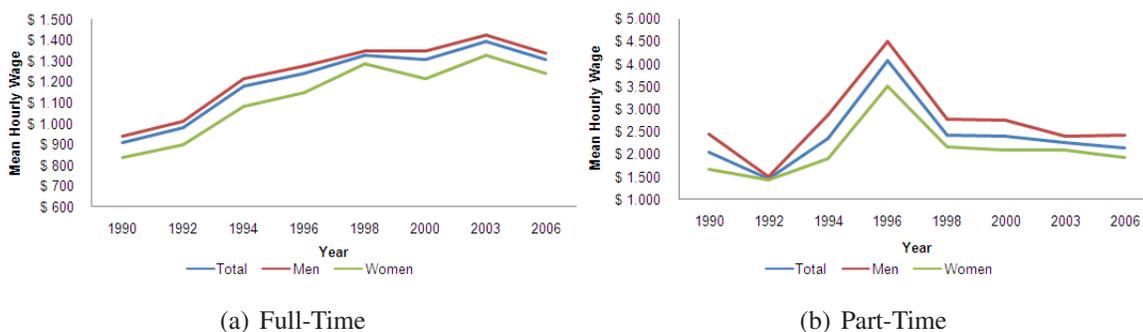
Figures 4 to 10 show the same relationship as figure 2, for years 2003, 2000, 1998, 1996, 1994, 1992, and 1990 respectively. The same analysis that was done to the 2006 case, can be done here. These means, that the behaviour of the mean hourly wage has remained very similar over the years.

Tables 4 and 5, show the mean hourly wage for part-time and full-time workers respectively. Just as Rau(2008), the hourly wage for part-time workers is larger than the hourly wage for their full-time counterparts. This happens for all years taken into account, and for both men and women. This is interesting, since evidence for European countries, as revised earlier, suggests that hourly wages for part-time workers should be lower. On the other hand, in the Australian case analyzed by Booth and Wood (2006), it was found that there is a pay premium for working part-time.

Another case to take into account, is that men's hourly wage is higher than women's. This also happens for all years taken into account, and for part-time and full-time. This coincides with what Mumford and Smith (2007) find for the UK. They also found that full-time men earn higher hourly wages than full-time women, and that part-time men earn higher hourly wages

than part-time women. This finding is also consistent with what Contreras and Puentes (2000), and Fuentes, Montero and Palma (2005) find for full-time workers in Chile.

Figure 3: MEAN HOURLY WAGE EVOLUTION  
1990-2006



Source: Own calculations based on respective CASEN surveys.

Figure 3 shows the evolution of hourly wages for the 1990-2006 period for men and women. Panel (a) shows the evolution for full-time hourly wage, whilst panel (b) shows the evolution for part-time hourly wage. From (a), it can be seen that hourly wages for full-time men and women have been steadily increasing throughout the years. From (b), on the other hand, it can be seen that it had a huge rise between 1992 and 1996, before suffering from a big cut in 1998. From then onwards till 2006, hourly wages for part-time workers steadily decreased. It is worth noticing that the female graph line is always situated below the male graph line for both panels, which supports what was said on the previous paragraph.

Finally, table 6 shows the wage gap between men and women for part-time and full-time work. Table 7, on the other hand, shows the wage gap between part-timers and full-timers for men and women. The wage gap shown at table 6 was obtained with the following formula:  $\frac{\bar{w}_M - \bar{w}_W}{\bar{w}_W}$ , where  $\bar{w}_M$  and  $\bar{w}_W$  represent the mean hourly wage for men and women respectively. The wage gap shown at table 7, on the other hand, was obtained using the following formula:  $\frac{\bar{w}_P - \bar{w}_F}{\bar{w}_F}$ , where  $\bar{w}_P$  and  $\bar{w}_F$  represent the mean hourly wage for part-timers and full-timers respectively.

## 4.2 CASEN Panel Survey

The CASEN panel survey, is survey with panel data with three waves, 1996, 2001, and 2006. It is handled by the “Ministerio de Planificación”, and the “Observatorio Social” from Alberto Hurtado University. It has representative data for households for four regions in Chile (III, VII, VIII and Metropolitan Region).

Tables 8 and 9, show transition matrices obtained from this panel. Table 8 shows the number of individuals, and their transitions for years 1996 and 2001, whereas table 9 does the same, but for years 2001 and 2006. Looking at table 8, we can see that out of the 4253 individuals who worked part-time during 1996, 626 became inactive in 2001, 259 where unemployed in 2001, 364 switch into part-time work in 2001, and 3.004 remained working full-time in 2001. Table 9, shows that out of the 2.229 individuals working full-time in 2001 (and were interviewed in 2006), 180 became inactive, 90 became unemployed, 141 switched into part-time work, and 1.818 remained working in full-time capacity in 2006. For the purpose of this study, I will focus on the analysis on those who chose to switch from full-time into part-time.

Taking this into account, tables 10 and 11 show some data on those full-timers in 1996 who chose to switch into part-time work (Treatment = 1), and those who chose to remain working full-time (Treatment = 0) in 2001. As it can be seen, those who switch into part-time work their hourly wage increased, but their whole salary, drops due to the fewer hours worked. This gives us some illustration on what we might find when estimating via matching. It is also noteworthy, that those who decided to change their work hours, were those who in average earned less hourly wages amongst full-timers in 1996. Table 11, shows that those who chose to change from full-time to part-time in average drop their hours worked in almost 30 hours, whilst those that remained don't make a significant change in their hours worked.

Tables 12 and 13, show the same analysis for the transition between 2001 and 2006. It can

be seen that individuals that stay in full-time, and individuals that switch into part-time, have a gain in hourly wages and also in full wage, though the effect for those who switched into part-time is much larger on hourly wages. Also is noteworthy that this effect is large enough to increase the total wage of these workers even though in average they worked nearly 29 hours less in 2006. Again, for those who chose to stay working full-time their mean worked hours stays roughly the same.

## 5 Results

This section will show the results obtained using the methodology already explained in section 3. For that matter, this section is divided into 3 parts. First I will show the results and comment on the wage gap decomposition between men and women, for part-time and full-time work. Next, I will show the results and comment on the wage gap decomposition between part-time and full-time, for men and women. Finally, I will present the results obtained from the matching estimation, to see if there is a premium when shifting from full-time to part-time.

### 5.1 Men/Women Wage Gap Decomposition

In this section I will discuss the results obtained for the wage gap between men and women. Said gap was analyzed separately for part-time and full-time workers. Tables 14 and 15, show the wage gap, and the “two-fold” decomposition coefficients discussed in section 3. Table 14 shows the results when viewing part-time workers, and table 15 shows the results when viewing full-time workers.

For part-time workers, it can be seen that throughout the period reviewed (1990-2006), the explained coefficient takes a negative value. This means that if there are no group differences, the resulting gap in wages should be lower. The unexplained coefficient, which is taken as the discrimination effect, shows that it has been declining during the last years (1992 is an exception), from 30% in 1990, to 17% in 2006.

For full-time workers, however this does not happen. As with part-time workers, the explained coefficient takes a negative value throughout the entire period reviewed. The unexplained coefficient, is much different the for part-timers, since it roams around 10% and 14%. Though it has fallen nearly around 1% in 2006 since 1990, it can be seen that for this workers the discrimination effect has been moderately flat.

## 5.2 Part-Time/Full-Time Wage Gap Decomposition

Tables 16 and 17, show the results obtained from the wage gap decomposition between part-time workers, and full-time workers. Table 16 shows the results obtained for male workers in the sample, whilst table 17 shows the results obtained for female workers in the sample.

As it can be seen, the wage gap between part-time and full-time workers has declined since 1990. For males, as it can be seen from table 16, it has gone from nearly 64% in 1990, to a much smaller value of 33%. However 33% is still a somewhat large wage gap. Looking at the explained coefficient for 2006, which takes a negative effect, if both groups had the same characteristics, part-timers should earn a lower hourly wage. However in most cases this values can't override the discrimination effect presented by the unexplained coefficient, and in even in some years, like 2000 it can go in the same direction. However it is noteworthy, that since 1990, the discrimination values have been reduced in a significant manner, from 59,6% in 1990 and 71,6% in 1996, to a much lower 36% in 2006. Considering O'Dorchai, Plasman, and Rycx (2007), these levels of discrimination are on par with countries like Ireland or even the UK, it leaves much to be desired when comparing with scandinavian countries such as Denmark.

Table 17 shows that for females, the wage gap between part-timers and full-timers has been steadily decreasing. In fact in 2006, the wage gap between part-timers and full-timers for women was lower than the wage gap for men. The explained coefficient shows that, for most years, if both groups had the same characteristics, part-time workers should earn a higher hourly wage (2003 is an exception). It can be seen that the discrimination effect denoted by the unexplained factor has also been decreasing over the time period analyzed, going from 52,4% in 1990 to 25,5% in 2006.

### 5.3 Matching: Pay-Premium or Pay-Penalty

As it was said in section 3.2, two treatments were evaluated using matching estimators. The first was the effect on hourly wages if an individual working full-time in 1996 switches into part-time in 2001. Table 18 shows the results obtained from the analysis, using 8 matches<sup>8</sup>. It shows that there is a positive effect on wages when switching from full-time to part-time, however the estimates obtained were not statistically significant.

The second treatment, follows the same logic. Where I wanted to view the effect on hourly wages when an individual working full-time in 2001 switches into part-time work in 2006. Table 19 shows the results obtained for the average treatment effect, the average treatment on the treated effect, and the average treatment on the controls effect. The results obtained for all three effects were statistically significant. As it can be seen, there is an increase in the hourly wages in nearly \$2.000 Chilean pesos when individuals shift into part-time work. This is contrary to what Connolly and Gregory find for women in the UK (2009), and similar to what Booth and Wood (2006) obtained in the Australian case, though the effect they find is much smaller. However it arouses some doubts that the effects of the treatment have such a high impact on hourly wages, specially for the control group.

---

<sup>8</sup>4 and 6 matches were also used, though similar results were obtained.

## 6 Conclusions

In this study a wage gap analysis was performed for the period comprised by the years 1990 and 2006, using the Oaxaca-Blinder methodology to decompose said gap. Two separate wage gap analysis were made: that between men and women, for part-time and full-time workers separately, and that between full-timers and part-timers, for men and women separately. Additionally a matching estimation using the Abadie, and Imbens nearest neighbour methodology was used, to measure the effect on changing from full-time into part-time work.

It was found for the wage gap between men and women, that the discrimination effect for part-timers has indeed diminished since 1990, whilst it has remained somewhat flat for full-timers. Despite this, the discrimination effect in full-timers is smaller than that of part-timers.

For the wage gap between part-time and full-time workers, it was found that discrimination effect along with the wage gap have diminished since 1990. This is the case for both Men and Women, though women tend to have a lower wage gap and unexplained coefficient than men.

It was also found that there is a positive effect on hourly wages when switching from full-time to part-time work, though the results for the transition between 1996 and 2001 were not statistically significant. The effects on the transition between 2001 and 2006, where statistically significant, but they raise some doubt on their validity since it is a large positive effect (most dubious is the case for the average treatment for the controls effect).

Considering what was found, even though discrimination levels have indeed dropped over time, there is much left to be done, specially if we compare to industrialized countries with a very mature and flexible labour market as the Netherlands or Denmark.

Considering Fuentes, Montero and Palma (2005), and Contreras and Puentes (2000), there is a selectivity bias, that may shift the discrimination levels upward.

All in all, though discrimination has gone down in Chile, it is still a problem, and specially in part-time labour. Since part-time work can also be considered precarious, it is recommended to focus on policies to change this situation, perhaps even at the cost of lowering the hourly wage offered.

## References

- [1] Abadie, A., Drukker, D., Leber, J. & Imbens, G. “Implementing Matching Estimators for Average Treatment Effects in Stata”, *The Stata Journal* Vol.4-N°3, 2004: 290-311.
- [2] Abadie, A. & Imbens, G. “Simple and Bias-Corrected Matching Estimators for Average Treatment Effects”, National Bureau of Economic Research, Working Paper N°283, 2002.
- [3] Booth, A. & van Ours, J. “Job Satisfaction and Family Happiness: The Part-Time Work Puzzle”, The Institute for the Study of Labor (IZA), Discussion Paper N°3020, 2007.
- [4] Booth, A. & Wood, M. “Back-to-Front Down-Under? Part-Time/Full-Time Wage Differentials in Australia”, The Institute for the Study of Labor (IZA), Discussion Paper N°2268, 2006.
- [5] Borghans, L., Duckworth, A., Heckman, J. & ter Weel, B. “The Economics and Psychology of Personality Traits”, The Institute for the Study of Labor (IZA), Discussion Paper N°3333, 2008.
- [6] Borjas, G. “Labor Economics”, McGraw-Hill/Irwin, 3rd Edition.
- [7] Bowlus, A. & Grogan, L. “Gender Wage Differentials, Job Search, and Part-Time Employment in the UK”. *Oxford Economic Papers* N°61, 2009: 275-303.
- [8] Connolly, S. & Gregory, M. “Moving Down: Women’s Part-Time Work and Occupational Change in Britain 1991-2001”, Department of Economics, Oxford University, Discussion Paper N°359, 2007.

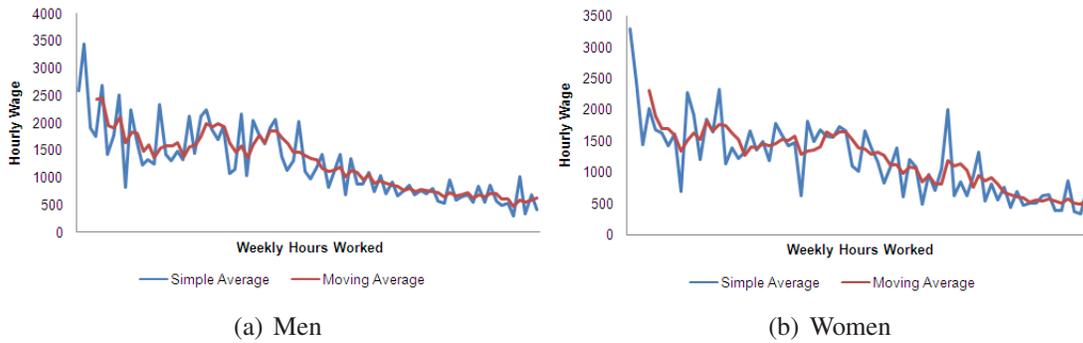
- [9] Connolly, S. & Gregory, M. “Part-Time Employment Can Be a Life-Time Setback for Earnings: A Study of British Women 1975-2001”, The Institute for the Study of Labor (IZA), Discussion Paper N°3101, 2007.
- [10] Connolly, S. & Gregory, M. “The Part-Time Pay Penalty: Earnings Trajectories of British Women”, Oxford Economic Papers N°61, 2009:i76-i97
- [11] Contreras, D. & Puentes, E. “Is the Gender Wage Discrimination Decreasing in Chile? Thirty Years of “Robust” Evidence”, Departamento de Economía, Universidad de Chile, Santiago, 2000.
- [12] Cáceres, R. “Jornada a Tiempo Parcial”, Consejo Asesor Presidencial Trabajo y Equidad, Diciembre, 2007.
- [13] Fuentes, J., Montero, R. & Palma, A. “Discriminación Salarial por Género en Chile: Una Mirada Global”, Estudios de Economía, Vol.32-N°2, Diciembre, 2005: 133-157.
- [14] Heckman, J. “Sample Selection Bias as Specification Error”, *Econometrica* Vol.47-N°1, 1979: 153-161.
- [15] Heller, S. & Leppel, K. “Determinants of Voluntary and Involuntary Part-Time Employment”, *Eastern Economic Journal* Vol.19-N°1, 1993.
- [16] Hirsch, B. “Why Do Part-Time Workers Earn Less? The Role of Worker and Job Skills”, The Institute for the Study of Labor (IZA), Discussion Paper N°1261, 2004.
- [17] Hu, Y. & Tijdens, K. “Choices for Part-Time Jobs and the Impacts on the Wage Differentials. A Comparative Study for Great Britain and The Netherlands”, *Integrated Research Infrastructure in the Socio-Economic Sciences*, Working Paper 2003-05, 2003.

- [18] Jann, B. “The Blinder-Oaxaca Decomposition for Linear Regression Models”, *The Stata Journal* Vol.8-N°4, 2008: 453-479.
- [19] Leiva, S. “Part-Time Work in Chile. Is it Precarious Employment? Reflections From a Gender Perspective”, *Serie Mujer y Desarrollo* N°26, CEPAL, Santiago, Enero, 2000.
- [20] López, F., Madrigal, L. & Pagés, C. “Part-Time Work, Gender and Job Satisfaction: Evidence From a Developing Country”, *The Institute for the Study of Labor (IZA), Discussion Paper* N°3994, 2009.
- [21] Mincer, J. “Schooling, Experience and Earnings”, *The National Bureau of Economic Research*, New York, 1974.
- [22] Ministerio del Trabajo y Previsión Social “Observatorio Laboral N° 16”, Santiago, Abril, 2005.
- [23] Mizala, A. & Romanguera, P. “La Legislación Laboral Y el Mercado del Trabajo en Chile: 1975-2000”, *Centro de Economía Aplicada, Departamento de Ingeniería Industrial, Universidad de Chile, Documento de Trabajo* N° 114, 2001.
- [24] Mumford, K. & Smith, P. “Assessing The Importance of Male and Female Part-Time Work for The Gender Earnings Gap on Britain”, *The Institute for the Study of Labor (IZA), Discussion Paper* N°2981, 2007.
- [25] Nelen, A. & de Grip, A. “Why do Part-Time Workers Invest Less in Human Capital Than Full-Timers”, *Research Centre for Education and the Labour Market, Faculty of Economics and Business Administration, Maastricht University*, 2008.
- [26] Oaxaca, R. “Male-Female Wage Differentials in Urban Labor Markets”, *International Economic Review* N° 14, 1973: 693-709.

- [27] O'Dorchai, S., Plasman, R. & Rycx, F. "The Part-Time Wage Penalty in European Countries: How Large is it for Men?", The Institute for the Study of Labor (IZA), Discussion Paper N°2591, 2007.
- [28] Rau, T. "Trabajo a Tiempo Parcial: Análisis del Caso Chileno", Departamento de Economía, Universidad de Chile, Santiago, Noviembre, 2008.

# A Figures

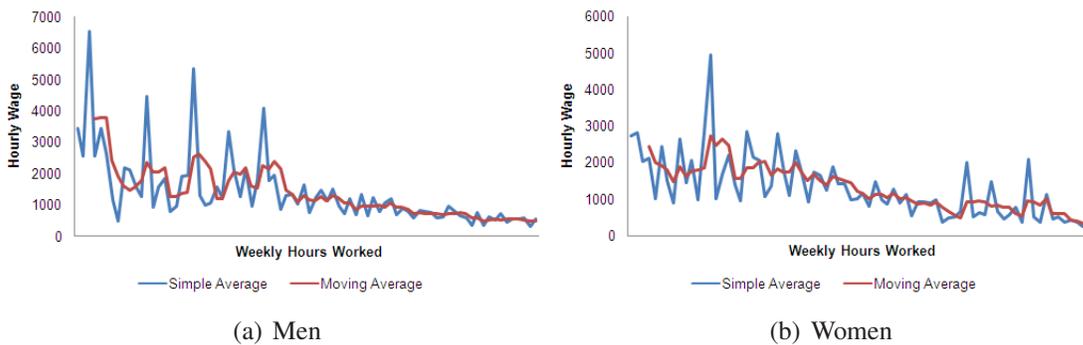
Figure 4: MEAN HOURLY WAGE BY WEEKLY HOURS WORKED  
2003



Source: Own calculations using CASEN 2003 survey.

Source: Sample includes workers from the private sector, with ages between 18 and 65 years, working between 10 and 90 weekly hours.

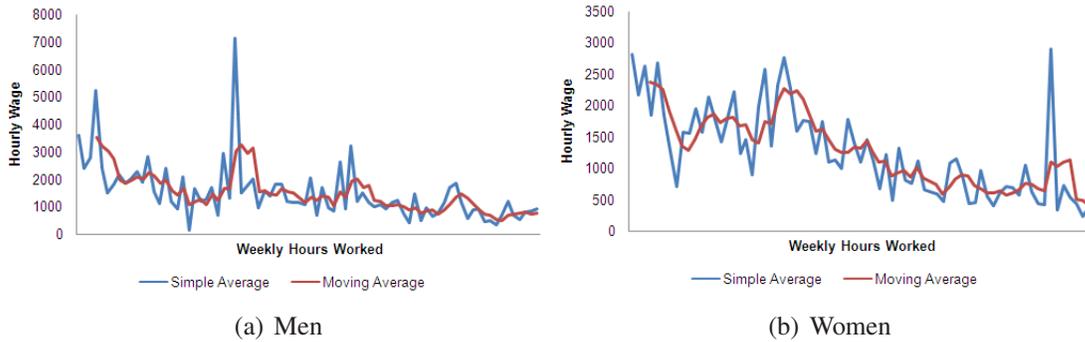
Figure 5: MEAN HOURLY WAGE BY WEEKLY HOURS WORKED  
2000



Source: Own calculations using CASEN 2000 survey.

Source: Sample includes workers from the private sector, with ages between 18 and 65 years, working between 10 and 90 weekly hours.

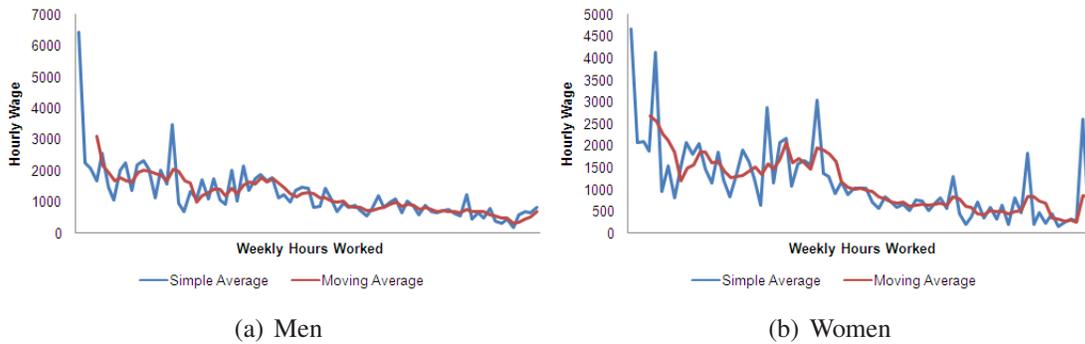
Figure 6: MEAN HOURLY WAGE BY WEEKLY HOURS WORKED  
1998



Source: Own calculations using CASEN 1998 survey.

Source: Sample includes workers from the private and public sector, with ages between 18 and 65 years, working between 10 and 90 weekly hours.

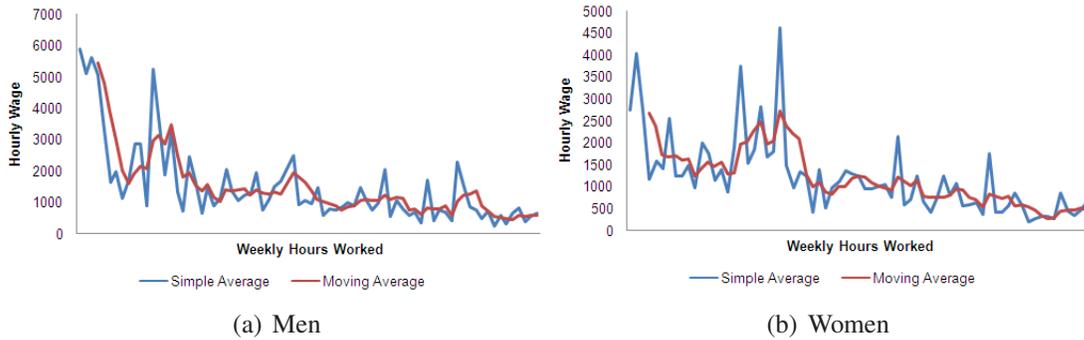
Figure 7: MEAN HOURLY WAGE BY WEEKLY HOURS WORKED  
1996



Source: Own calculations using CASEN 1996 survey.

Source: Sample includes workers from the private and public sector, with ages between 18 and 65 years, working between 10 and 90 weekly hours.

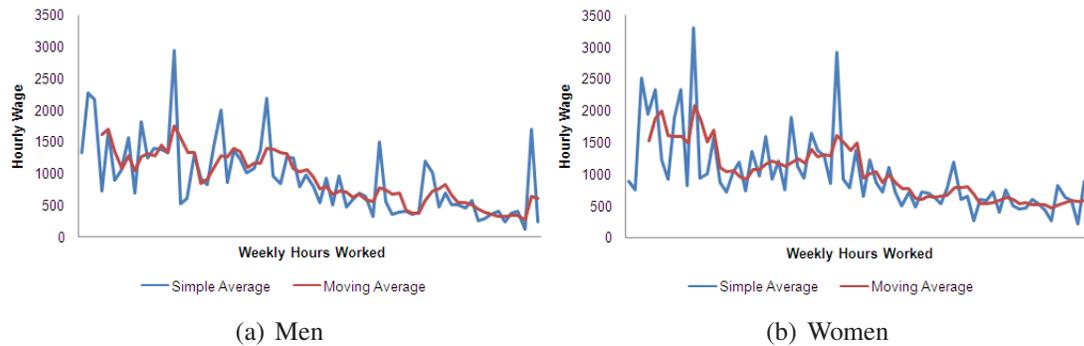
Figure 8: MEAN HOURLY WAGE BY WEEKLY HOURS WORKED  
1994



Source: Own calculations using CASEN 1994 survey.

Source: Sample includes workers from the private and public sector, with ages between 18 and 65 years, working between 10 and 90 weekly hours.

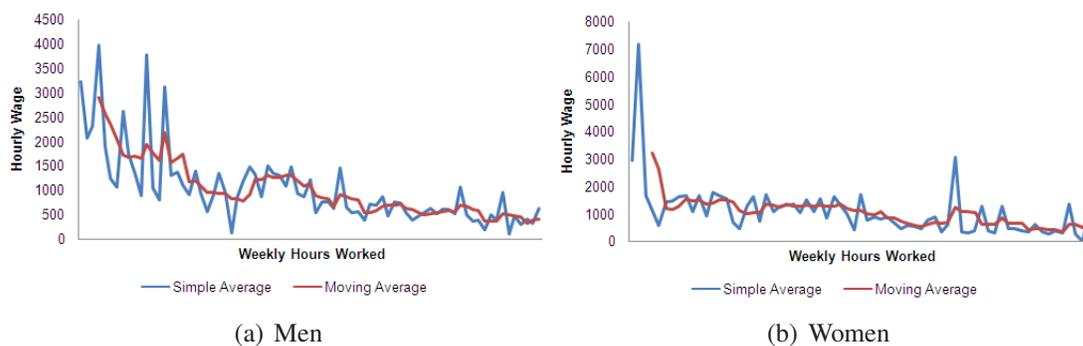
Figure 9: MEAN HOURLY WAGE BY WEEKLY HOURS WORKED  
1992



Source: Own calculations using CASEN 1992 survey.

Source: Sample includes workers from the private and public sector, with ages between 18 and 65 years, working between 10 and 90 weekly hours.

Figure 10: MEAN HOURLY WAGE BY WEEKLY HOURS WORKED  
1990



(a) Men

(b) Women

Source: Own calculations using CASEN 1990 survey.

Source: Sample includes workers from the private and public sector, with ages between 18 and 65 years, working between 10 and 90 weekly hours.

## B Tables

Table 1: LABOUR FORCE PARTICIPATION 1990-2006  
WHOLE WORKFORCE

Year	Total	Men	Women
1990	52,02%	73,60%	32,54%
1992	54,01%	75,83%	34,27%
1994	54,56%	75,51%	35,50%
1996	54,82%	74,66%	36,54%
1998	55,90%	74,68%	38,80%
2000	55,89%	73,35%	39,79%
2003	57,06%	73,12%	42,18%
2006	57,30%	72,63%	43,25%

*Source:* Own calculations based on respective CASEN surveys.

Table 2: LABOUR FORCE PARTICIPATION 1990-2006  
PART-TIME WORKERS

Year	Total	Men	Women
1990	11,40%	8,42%	17,60%
1992	9,40%	6,50%	15,38%
1994	9,89%	6,92%	15,82%
1996	12,47%	9,31%	18,58%
1998	14,06%	9,97%	21,39%
2000	12,87%	8,52%	20,42%
2003	16,96%	12,77%	24,00%
2006	16,01%	10,69%	24,50%

*Source:* Own calculations based on respective CASEN surveys.

Table 3: SAMPLE USED 1990-2006

Year	Total	Men	Women
1990	2.834.194	70,77%	29,23%
1992	3.181.122	70,81%	29,19%
1994	3.243.942	70,05%	29,95%
1996	3.076.756	71,55%	28,45%
1998	3.575.047	66,55%	33,45%
2000	3.053.992	69,40%	30,60%
2003	3.390.269	69,11%	30,89%
2006	3.871.424	67,42%	32,58%

*Source:* Own calculations based on respective CASEN surveys.

*Note:* For years 1990, 1992, 1994, and 1998 workers can't be distinguished between the private and public sector.

Table 4: MEAN HOURLY WAGES FOR PART-TIME WORKERS

Year	Total	Men	Women
1990	\$ 2.051	\$ 2.439	\$ 1.660
1992	\$ 1.467	\$ 1.516	\$ 1.426
1994	\$ 2.355	\$ 2.877	\$ 1.908
1996	\$ 4.079	\$ 4.492	\$ 3.512
1998	\$ 2.421	\$ 2.776	\$ 2.165
2000	\$ 2.395	\$ 2.758	\$ 2.102
2003	\$ 2.254	\$ 2.399	\$ 2.087
2006	\$ 2.139	\$ 2.420	\$ 1.926

*Source:* Own calculations based on respective CASEN surveys. Sample used includes workers from the private sector, with ages between 18 and 65 years.

*Note 1:* Wages are expressed in 2006 chilean pesos.

*Note 2:* For years 1990, 1992, 1994, and 1998 workers can't be distinguished between the private and public sector.

Table 5: MEAN HOURLY WAGES FOR FULL-TIME WORKERS

Year	Total	Men	Women
1990	\$ 909	\$ 937	\$ 837
1992	\$ 978	\$ 1.008	\$ 899
1994	\$ 1.179	\$ 1.217	\$ 1.082
1996	\$ 1.241	\$ 1.275	\$ 1.147
1998	\$ 1.328	\$ 1.347	\$ 1.285
2000	\$ 1.307	\$ 1.346	\$ 1.213
2003	\$ 1.396	\$ 1.425	\$ 1.326
2006	\$ 1.307	\$ 1.335	\$ 1.241

*Source:* Own calculations based on respective CASEN surveys. Sample used includes workers from the private sector, with ages between 18 and 65 years.

*Note 1:* Wages are expressed in 2006 chilean pesos.

*Note 2:* For years 1990, 1992, 1994, and 1998 workers can't be distinguished between the private and public sector.

Table 6: MEN/WOMEN WAGE GAP

Year	Part-Time	Full-Time
1990	47%	12%
1992	6%	12%
1994	51%	12%
1996	28%	11%
1998	28%	5%
2000	31%	11%
2003	15%	7%
2006	26%	8%

*Source:* Own calculations based on respective CASEN surveys. Sample used includes workers from the private sector, with ages between 18 and 65 years.

*Note 1:* Gap calculated as  $\frac{W_M - W_W}{W_W}$ .

*Note 2:* For years 1990, 1992, 1994, and 1998 workers can't be distinguished between the private and public sector.

Table 7: PART-TIME/FULL-TIME WAGE GAP

Year	Men	Women
1990	160%	98%
1992	50%	59%
1994	136%	76%
1996	252%	206%
1998	106%	68%
2000	105%	73%
2003	68%	57%
2006	81%	55%

*Source:* Own calculations based on respective CASEN surveys. Sample used includes workers from the private sector, with ages between 18 and 65 years.

*Note 1:* Gap calculated as  $\frac{W_P - W_F}{W_F}$ .

*Note 2:* For years 1990, 1992, 1994, and 1998 workers can't be distinguished between the private and public sector.

Table 8: TRANSITION MATRIX BETWEEN 1996 AND 2001

	Inactive 2001	Unemployed 2001	Part-Time 2001	Full-Time 2001	Total
Inactive 1996	4.405	301	282	845	5.833
Unemployed 1996	123	33	43	164	363
Part-Time 1996	212	36	126	344	718
Full-Time 1996	626	259	364	3.004	4.253
Total	5.366	629	815	4.357	11.167

*Source:* Own calculations based on CASEN panel survey.

Table 9: TRANSITION MATRIX BETWEEN 2001 AND 2006

	Inactive 2006	Unemployed 2006	Part-Time 2006	Full-Time 2006	Total
Inactive 2001	969	90	83	434	1.576
Unemployed 2001	43	36	29	194	302
Part-Time 2001	64	22	44	213	343
Full-Time 2001	180	90	141	1.818	2.229
Total	1.256	238	297	2.659	4.450

*Source:* Own calculations based on CASEN panel survey.

Table 10: AVERAGE WAGES AND HOURLY WAGES BY TREATMENT  
1996-2001

Treatment	Wage per Hour 1996	Wage per Hour 2001	Wage 1996	Wage 2001
0	1.026	1.038	145.490	179.332
1	845	2.291	120.376	112.809

*Source:* Own calculations based on CASEN panel survey.

*Note:* Wages expressed in 2006 Chilean pesos.

Table 11: AVERAGE WORKED HOURS BY TREATMENT  
1996-2001

Treatment	1996 Hours	2001 Hours
0	49,59	49,45
1	48,79	19,00

*Source:* Own calculations based on CASEN panel survey.

Table 12: AVERAGE WAGES AND HOURLY WAGES BY TREATMENT  
2001-2006

Treatment	Wage per Hour 2001	Wage per Hour 2006	Wage 2001	Wage 2006
0	980	1.074	168.188	213.556
1	718	2.693	119.018	161.725

*Source:* Own calculations based on CASEN panel survey.

*Note:* Wages expressed in 2006 Chilean pesos.

Table 13: AVERAGE WORKED HOURS BY TREATMENT  
1996-2001

Treatment	2001 Hours	2006 Hours
0	49,00	49,47
1	49,11	20,63

*Source:* Own calculations based on CASEN panel survey.

Table 14: MEN/WOMEN PART-TIMER WAGE GAP  
1990-2006

	2006	2003	2000	1998
$\log(w_M) - \log(w_W)$	0,1070581	-0,0206959	0,0239989	-0,0087417
Explained	-0,0690101	-0,1599295	-0,1588983	-0,1611878
Unexplained	0,1760683	0,1392336	0,1828972	0,1524461

	1996	1994	1992	1990
$\log(w_M) - \log(w_W)$	-0,1377493	0,1574488	-0,0505417	-0,0041858*
Explained	-0,3915188	-0,1206193	-0,1875821	-0,3045319
Unexplained	0,2537695	0,2780681	0,1370404	0,3003461

*Source:* Own calculations based on respective CASEN surveys. Sample used includes part-time workers from the private sector, with ages between 18 and 65 years.

\*: Not statistically significant.

Table 15: MEN/WOMEN FULL-TIMERS WAGE GAP  
1990-2006

	2006	2003	2000	1998
$\log(w_M) - \log(w_W)$	0,0453796	-0,0101698	0,0366446	-0,0119067
Explained	-0,0731196	-0,1007635	-0,1044412	-0,1298049
Unexplained	0,1184993	0,0905937	0,1410858	0,1178983

	1996	1994	1992	1990
$\log(w_M) - \log(w_W)$	0,0118675	0,0020881	0,031313	-0,0008856*
Explained	-0,1169663	-0,1478754	-0,1017522	-0,1221886
Unexplained	0,1288339	0,1499634	0,1330651	0,121303

*Source:* Own calculations based on respective CASEN surveys. Sample used includes full-time workers from the private sector, with ages between 18 and 65 years.

\*: Not statistically significant.

Table 16: MEN'S PART-TIME/FULL-TIME WAGE GAP  
1990-2006

	2006	2003	2000	1998
$\log(w_P) - \log(w_F)$	0,3344602	0,3032677	0,4517085	0,4834647
Explained	-0,0288969	-0,104292	0,0259669	-0,0285491
Unexplained	0,3633571	0,4075597	0,4257416	0,5120138

	1996	1994	1992	1990
$\log(w_P) - \log(w_F)$	0,5224522	0,6814374	0,377648	0,6376832
Explained	-0,1937995	0,0974816	0,0114757	0,041528
Unexplained	0,7162517	0,5839558	0,3661723	0,5961551

*Source:* Own calculations based on respective CASEN surveys. Sample used includes male workers from the private sector, with ages between 18 and 65 years.

Table 17: WOMEN'S PART-TIME/FULL-TIME WAGE GAP  
1990-2006

	2006	2003	2000	1998
$\log(w_P) - \log(w_F)$	0,2727817	0,3137938	0,4643542	0,4802997
Explained	0,0174134	-0,0411546	0,1394185	0,0647122
Unexplained	0,2553683	0,3549485	0,3249357	0,4155875

	1996	1994	1992	1990
$\log(w_P) - \log(w_F)$	0,672069	0,5260767	0,4595027	0,6409833
Explained	0,0667623	0,1450091	0,2080259	0,1169195
Unexplained	0,6053067	0,3810675	0,2514768	0,5240638

*Source:* Own calculations based on respective CASEN surveys. Sample used includes female workers from the private sector, with ages between 18 and 65 years.

Table 18: SWITCH FROM FULL-TIME IN 1996, TO PART-TIME IN 2001

	Coefficient	Standard Error
ATE	94,87791*	79,32118
ATT	93,95139*	77,49141
ATC	116,4697*	77,81124

*Source:* Own calculations based on CASEN panel survey.

*Note:* Number of matches: 8.

\*: Not statistically significant.

Table 19: SWITCH FROM FULL-TIME IN 2001, TO PART-TIME IN 2006

	Coefficient	Standard Error
ATE	1459,231	373,3899
ATT	1945,907	8,623098
ATC	1429,74	375,6313

*Source:* Own calculations based on CASEN panel survey.

*Note:* Number of matches: 8.