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Evidence from Argentina

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Abstract

This paper takes advantage of several reforms that provide time and cross sectional variation to identify the effects of unemployment insurance and severance payments on the duration of unemployment and on the separation probability in Argentina. Administrative data permits analysis of the duration of unemployment of covered spells with detailed information about transfers and their duration, while household surveys permit the study of separation probability and transitions to informal jobs, which are not observed in administrative data. It is found that unemployment duration increases significantly when unemployment insurance transfers are higher or are provided for a longer period; the effects of severance pay on unemployment duration are less robust. On the other hand, higher severance pay is found to reduce separation probability, while unemployment insurance transfers have a positive but small effect on separations.

JEL Classifications: I38, J64, J65, J68

Keywords: Unemployment insurance, Severance payments, Regression discontinuity, Duration models.

1 Introduction

There are three types of labor policies aimed at protecting workers against unemployment in Argentina: severance payments (SP), unemployment insurance (UI) and temporary public works. This paper analyzes the effects of two of these policies, severance payments and the unemployment insurance system, on several labor market outcomes.

The severance payment system is the traditional form of protection against the risks of unemployment in Argentina. The unemployment insurance program is managed by both the Ministry of Labor and the National Social Security Administration and is one of the components of the social security system.

The literature has focused mainly on the impact of both instruments on the duration of unemployment, in particular stressing the "moral hazard effect." This designation is related to the principal-agent problem inherent to the optimal unemployment insurance problem, in which the government faces the trade-off of providing liquidity and insurance to workers but with the welfare cost of reducing search effort. Meyer (1990) and Katz and Meyer (1990) are the main references in this line. In this first approach, the UI is viewed mainly as a distortion: given that workers receive UI only if they are unemployed, this transfer reduces the income gain of being employed, generating a substitution effect.

Nevertheless, unemployment insurance increases the duration of unemployment not only because of disincentives to search but also because of liquidity provision: if workers increase their liquidity due to the UI transfer they would search with less effort (and their reservation wages would increase). As emphasized by Chetty (2008), much of the extension in unemployment duration caused by UI is due to a "liquidity effect" rather than distortions in marginal incentives to search ("moral hazard effect"). The main point of that paper is that both effects are present and can be measured using severance pay as an unconditional transfer to measure the "liquidity effect."[1]

A second and very important effect of both instruments is on the probability of transiting from unemployment to informality. UI benefits can be distortive in the sense that increases the finding probability of informal jobs, which cannot be monitored by the government (see Alvarez-Parra and Sanchez (2009)). But again, unemployment insurance has two effects: one distortive, which implies a higher probability of informality at reemployment, and one welfare-improving,

[1]The UI benefit is a flow given to the unemployed worker conditional on not finding a job. This transfer can be decomposed in an unconditional transfer (whichever the labor market outcome) and in a negative flow in the case the worker finds a job. The first type of transfer is a non-distortive welfare improving "liquidity provision" and can be proxied by a lump-sum transfer given to the worker at the begining of the spell (for example, by severance pay). The second flow, which is an effective reduction in net re-employment wages, is distortive, welfare reducing, and the generates the "moral hazard" response. For his exercise, Chetty (2008) measures the total effect of UI on unemployment duration and the "liquidity effect" analyzed through the effect of SP on duration; "moral hazard" effect is implied by these two measures. His conclusion is that around 60 percent of the effect of UI is driven by the "liquidity effect."

related to the fact that UI finances the search process so that workers can wait to meet a suitable formal job opening. In this case, the effects go in opposite directions: the welfare-improving effect implies a higher probability of finding a formal job, while the "substitution effect" reduces this probability.

These policies also affect other labor market outcomes like the separation probability. In particular, SP transfers are a firing cost that can reduce separations while UI benefits could increase separations; effort on the job could be reduced given that unemployment insurance is available.

The main objective of this paper is to estimate the effects of both instruments, SP transfers and UI benefits, on these labor market outcomes in Argentina. We use two databases in order to achieve this objective: the household survey database and an administrative database constructed especially for this work and that has not been used before.

The rest of the paper is organized as follows. The next section describes the severance payments (SP) and unemployment insurance (UI) policies, highlighting the changes in legislation and eligibility characteristics that allow us to evaluate the effects of these instruments on several labor market outcomes. Section 3 describes the labor market in Argentina. Section 4 presents the methodology we use to measure the impact of both instruments, SP and UI, on unemployed and employed workers. Section 5 presents impact estimations using administrative data, and Section 6 shows our impact estimations using the household survey data set. Section 7 concludes.

2 Unemployment Assistance Programs in Argentina

Three types of labor policies aimed at protecting workers against unemployment exist in Argentina: Severance payments, unemployment insurance and temporary public works. Next, we describe these policies, emphasizing the characteristics of severance payments and unemployment insurance that allow for identifying their impact either on the labor demand or on the labor supply.

2.1 Severance Payments

The traditional form of protection against unemployment in Argentina is severance payments. According to the Constitution, the law should protect workers against arbitrary dismissal (Article 14bis). The current Argentine labor code (Law No. 20744) was enacted in 1974 and follows several concepts of Law No. 11729 introduced in 1934. The legal origin of these laws is the French civil code, and they are notoriously complex pieces of legislation, like most labor codes in the region. In this section we describe in-form regulations. Whether they are implemented in practice will be discussed later.

The labor code establishes a number of benefits that workers receive in case of dismissal. They are: advance notice, severance pay, unused vacation time and the proportional share of the thirteenth monthly wage (Christmas bonus in the United States or *aguinaldo* in Argentina). These benefits vary depending on several characteristics including reasons for dismissal, sector of activity,

type of labor contract, and worker's tenure. In a nutshell, the main concept is that an employee with an indefinite contract who is dismissed receives from the employer:

- One monthly salary per year of tenure (or fraction higher than three months) of severance pay.[2]
- One monthly salary of advance notice.[3]
- Unused vacation time and the proportional share of the Christmas bonus.[4]

Workers are not legally entitled to receive severance pay if they voluntarily leave the firm, if they retire, or if they are laid off with "fair cause" (this is determined by a judge).

Workers also do not receive severance pay if at the end of the trial period (i.e., the third month of employment) the employer decides to terminate the relationship. Workers with fixed-term contracts receive the same severance as workers with indefinite jobs if dismissed during the contract, and receive half of the severance pay at the end of the term if the length of the contract was one year or more. These are the general rules, but there are some exceptions: First, severance pay is reduced by half if the employer proves that the dismissal is due to economic hardship, or if the employer becomes bankrupt for reasons that are beyond her/his control. In both cases, a judge determines whether the reduction in severance pay applies. Second, there are a number of special circumstances in which the employer has to pay a higher severance compared to the "one monthly salary per year of tenure" rule. They are: dismissing a woman anytime between 7.5 months before and 7.5 months after giving birth, dismissing a worker anytime between three months before and six months after marriage, dismissing an unregistered worker, and dismissing a labor union delegate or a labor union candidate.

According to the letter of the law, these regulations apply to all workers in the private sector, except rural, construction and domestic workers. Although Argentina is a federal country, there is no variation in severance pay policy across provinces.

2.1.1 Labor Courts and Severance

The previous section describes in-form regulations.[5] Do employers currently comply with these regulations? Which legal means do workers have to receive the benefits to which they are legally

[2] If the worker's salary has changed over time, then, severance pay has to be computed using the higher monthly salary received during the last year.

[3] This is for employees with 5 years of tenure or less. For workers with more tenure the advance notice is equal to 2 monthly salaries.

[4] For example, if a worker is dismissed three months after receiving the Christmas bonus, then she/he would receive one fourth of a monthly salary and the unused vacation time. Vacation time depends on tenure as follows: 14 days when tenure is 5 years or less, 21 days when tenure is between 5 and 10 years, 28 days when tenure is between 10 and 20 years, and 35 days when tenure is more than 20 years.

[5] This section is based on Ronconi (2006).

entitled? Is the judiciary system efficient? How does the judiciary determine whether a dismissal was due to economic hardship or with "fair cause"?

According to the letter of the law, all workers who are dismissed or who lose their jobs because the firm becomes bankrupt, should receive severance pay except if they are fired with "fair cause." According to the national household survey ("Encuesta Permanente de Hogares," EPH hereafter), only 32.4 percent of dismissed workers actually received severance. Regrettably, the survey does not allow determining the type of dismissal. But because dismissal with "fair cause" is rather rare, this figure suggests that employer noncompliance with severance pay is quite common.

Furthermore, none of the workers who lost their jobs because the contract came to an end report receiving severance. However, the letter of the law obliges employers to pay severance at the end of fixed-term contacts. Employers are exempt from severance if at the end of the trial period they decide to terminate the relationship. A potential explanation for lack of compliance with severance pay regulations is an ineffective judiciary. The Argentine judiciary system is organized into a number of jurisdictions, and one of these jurisdictions specializes in labor cases. Although there is little systematic evidence, labor courts in Argentina are known for usually supporting employees. This is mainly because the labor code (Law No. 20744) establishes that judges have to rule in favor of workers when there is any doubt about the application of labor law. First, there are few cases of dismissal due to economic hardship because labor courts hardly ever accept employers' arguments. Second, courts tend to rule that a dismissal with "fair cause" actually occurred only when the employer shows sufficient evidence that the employee committed a serious misdemeanor (e.g., theft or repeated absence). Third, there are some exceptional circumstances in which even when the employee quits, the court determines that the worker should receive severance.[6] Finally, judicial backlog does not appear to be a major problem among labor courts in Argentina. Hammergren (2003) finds that the median time to disposition for labor cases is less than a year, and that 86 percent reach closure within the four-year period.[7]

If labor courts tend to support employees and if judges take a reasonable amount of time to reach judgment, why is it that a large share of dismissed workers do not receive the severance pay to which they are legally entitled? Two plausible explanations are lack of access to the judiciary and weak enforcement of judgments (Hammergren (2003)). In Argentina, parties to a case are required to have legal representation (i.e., self-representation is banned), and since legal aid systems are

[6] In January 2010, a labor court ruled that a beverage firm should pay severance to a worker who quit the job, arguing that he was under psychological stress.

[7] The author finds that the appeal rate is 41 percent for labor cases, and that employers are particularly likely to appeal to delay final judgment. She finds, however, that appeals do not add much additional time. When delays occur, it is often the fault of the plaintiff or the fault of the plaintiff's lawyer. Defendant or judge-caused delays are less frequent. These results are based on a stratified sample of cases drawn from courts in the city of Buenos Aires and Santa Fe in 2000.

lacking, they usually have to pay for it.[8] According to the interviews we conducted, lawyers are eager to represent dismissed workers who are likely to receive a large severance pay because the lawyer's fees are usually a share of the benefit. But a worker who expects receiving a small severance (either because she/he had a low wage or little tenure) can hardly find a lawyer willing to represent her/him.

2.1.2 Reforms to Severance

The chapter of Law No. 20744 that regulates dismissals was reformed a number of times during the 1990s. In 1991 and 1995 efforts to increase flexibility included the creation of temporary and fixed-term contracts, a trial period, a ceiling on severance payments, and a reduction in advance notice provisions. But in 1998, the length of the trial period was reduced and many types of temporary contracts, which entailed no severance payments and were extensively used by employers, were eliminated.

During the last decade there were a number of changes to severance. In February 2002, Law No. 25561 established a 100 percent increase in severance pay; that is, the benefit was increased to 2 monthly salaries per year of tenure. It also established that the higher severance only applies to workers who were hired before February 2002. This reform was introduced in response to the country's deep economic and political crisis, which began in December 2001. Additionally, it became very unlikely for employers to be granted the reduction in severance due to economic hardship. In January 2005, the increase was reduced to 80 percent (that is, 1.8 monthly salaries per year of tenure), and to 50 percent in November 2005 (that is, 1.5 monthly salaries per year of tenure). Law No. 25972 established that this higher level of severance will automatically end when the unemployment rate becomes lower than 10 percent. In September 2007 the unemployment rate effectively became lower than 10 percent, and hence, since that date the severance pay is back to its original level, that is, 1 monthly salary per year of tenure.[9]

Are employers less likely to dismiss workers when severance pay is higher? Does higher dismissal costs reduces labor demand? Does it equally affect demand for low-skilled and high-skilled workers? The substantial changes in dismissals costs described above provide a good opportunity to explore how employers react to severance. For example, we can explore whether changes in hiring and firing practices occurred between "several months before" and "several months after" September 2007. Because firms experienced few shocks during that period (except for the change

[8] Employees who work for a firm located in the city of Buenos Aires have access to the Asistir program, which provides free labor counseling.

[9] There was some confusion regarding the date of expiration of the higher severance, because in February 2007 the National Institute of Statistics (INDEC) announced that the unemployment rate was 8.7 percent. This rate, however, was computed counting the beneficiaries of the Plan Jefes de Hogar as employed. The government clarified this issue via Decree No. 1227/2007, which establishes that the date of expiration of the higher severance is September 2007.

in severance policy), any change in hiring and firing practices is likely to capture the effect of the policy.

2.2 Unemployment Insurance

Unemployment insurance (UI), introduced in 1991 (Law No. 24013), is one of the components of the social security system. The program is financed by a 1.5 percent payroll tax on employers (although in some regions the tax rates are lower), and it is managed by both the Ministry of Labor and the National Social Security Administration (ANSES).

2.2.1 Coverage and Eligibility

To be eligible the worker must be unemployed, must have been laid off without "fair cause,"[10] should not be receiving either a pension or a workfare benefit, should not be receiving workers' compensation benefits, and must have contributed to the program during at least 6 out of the last 36 months.[11] The latter requirement is particularly binding because a large fraction of unemployed workers have no contributions to the system.[12] This last condition and the prevalence of informality and self-employment jobs explain the low UI coverage of the unemployed: in 2010 only 4.5 percent of the unemployed benefited from UI transfers. This rate was even lower before 2006, where the number of contributions required to be eligible for UI transfers were reduced (from 12 to 6 in the last 36 months).

The program covers all private sector employees except construction, rural, domestic workers, school teachers, and university professors.[13] Public sector employees are also excluded.

Construction workers were incorporated into the UI system in January 2001 (Law No. 25371). The latter incorporation of construction workers into the UI system is in part because

[10] Workers who have been dismissed with "fair cause" have a chance to receive unemployment insurance benefits if they sent a formal note to the employer expressing their disagreement with the decision, and if the Ministry of Labor accepts their petition to participate in the program.

[11] Monthly contributions can be either continuous or discontinuous. There were some changes in this requirement in 2006, as we explain below.

[12] This is because they have no work experience, or because they worked as self-employed, or because their former employer did not contribute to the social security system. ANSES' employees mentioned in the interviews that there are cases where UI claimants present evidence that they had a formal job, but their employers did not make contributions to the social security system. In those cases, the worker usually receives the UI benefits, and ANSES inspects the employer who did not make the mandatory contribution.

[13] Construction workers were incorporated into the UI system in January 2001 (Law No. 25371). The latter incorporation of construction workers into the UI system is in part because since 1980 they have access to a special protection program known as Fondo de Cese Laboral (FCL). The FCL works as follows: The employer makes a monthly contribution into the worker's individual account and the worker receives the accumulated benefits upon employment termination. The monthly contribution is equal to 12 percent of the worker's wage during the first year of tenure, and 8 percent of the wage afterwards.

since 1980 they have access to a special protection program known as Fondo de Cese Laboral (FCL).[14]

There are no needs or assets tests to determine eligibility. People from all nationalities and any type of immigration status can participate. Eligibility does not depend on the working status of the claimant's spouse. The eligibility requirements are available on-line at www.anses.gov.ar

To maintain eligibility, beneficiaries have to participate in the training programs that the Ministry of Labor asks them to take. They also have the obligation to notify ANSES in case of becoming employed. But as we will discuss below, these requirements are usually not implemented in practice.

2.2.2 Application Process

The worker must first ask for an appointment with the ANSES. Appointments can be made either by telephone (toll-free number) or by email. The application can only be initiated by the worker. Applicants have 90 working days from the date they were dismissed to ask for an appointment. If they start the application later, they receive 1 day less of benefits for each day of delay.

Workers must provide the following documentation: ID (immigrants without ID are exempt from this requirement) and a copy of the dismissal letter. They must also sign a form where they declare that they meet the eligibility requirements.[15]

How long does it take the application process? According to the interviews we conducted among ANSES' employees, it takes between 15 and 30 days between applying and receiving the first benefit.

2.2.3 Benefit Duration and Amount

Workers receive a monthly benefit starting the month immediately after dismissal.[16] Workers are eligible for 2 to 18 months of support depending on: age, the type of labor contract they had, in which sector they worked and on the number of months they had contributed to the system before dismissal.

Table 1 shows how UI duration varies according to age, months of contributions and sector of activity. The rules in panel A apply to all eligible non-construction workers who had an indefinite contract and who have contributed to the system for 6 or more months during the last 36

[14]The FCL works as follows: The employer makes a monthly contribution into the worker's individual account and the worker receives the accumulated benefits upon employment termination. The monthly contribution is equal to 12 percent of the worker's wage during the first year of tenure, and 8 percent of the wage afterwards.

[15]This requirement was introduced in October 2001.

[16]Except construction workers who receive support from the FCL. Their access to UI benefits starts two months after dismissal.

Table 1. Unemployment Insurance Duration

Panel A: Non-construction workers			Panel B: Construction workers		
Months with contributions to UI during the last 36 months	Months of UI support if age < 45	if age ≥ 45	Months with contributions to UI during the last 24 months	Months of UI support if age < 45	if age ≥ 45
6 to 11	2	8	8 to 11	3	9
12 to 23	4	10	12 to 17	4	10
24 to 35	8	14	18 or more	8	14
36 or more	12	18	-	-	-

Source: Author's calculations using the EPH.

Note: Before March 2006, only workers with at least 12 months of contributions during the last 36 months were eligible.

months.[17] The rules in panel B apply to construction workers who had contributed to the system for 8 or more months during the last 24 months.

As Table 1 shows, there is a discontinuity at age 45. Workers 45 years or older receive UI support for 6 additional months. Does access to UI benefits reduce labor force participation? We can test this hypothesis by comparing reentry rates between UI beneficiaries 40 to 44 years old and UI beneficiaries 45 to 49 years old. Because the chances of getting a job are likely to be similar between these two groups, any difference in reentry rates is likely to be the consequence of UI.

The monthly benefit the worker receives is equal to half of her/his best salary during the last 6 months of employment, but should also fall within the minimum and maximum thresholds established by the National Council of Employment, Productivity and Minimum Wage.[18] Since March 2006, the thresholds have been 250 and 400 pesos (83 and 133 US dollars, respectively). Because the maximum threshold is set quite low, most beneficiaries actually receive that amount.[19] Benefits also decrease over time. Beneficiaries receive the full amount of UI during the first 4 months, 85 percent of the full amount during months 5 to 8 and 70 percent of the full amount from months 9 to 18.

Beneficiaries have the option to request receiving the total amount of UI benefits as a lump sum to start a new business as self-employed. The Ministry of Labor decides whether to accept the petition depending on the quality of the proposal presented by the applicant. According to

[17] Workers who had a fixed-term contract or were hired by an employment service firm receive 1 day of benefits for each 3 days of contributions if they have contributed for at least 3 months during the last year. If they have 12 months or more of contributions during the last 36 months, then they receive the same treatment as workers with an indefinite contract.

[18] The council is composed of labor union leaders, business representatives, and the Ministry of Labor.

[19] The legal minimum wage in Argentina is 1,500 pesos per month (500 US dollars) and the median wage among formal employees is 2,000 pesos (667 US dollars) according to what workers report in the EPH.

ANSES' employees, some beneficiaries received the lump sum in the mid-1990s, but nowadays it is rarer.[20] The analysis of the administrative database of unemployment beneficiaries shows that less than 1 percent of the sample actually received a lump sum.

Benefit amounts are not indexed and do not depend on household consumption. The legislation does not provide for explicit policies during recessions, but there was an exception. In April 2003 some localities in the provinces of Santa Fe and Entre Rios suffered severe floods. UI beneficiaries residing in the affected localities were granted a six-month extension in the benefits.

UI beneficiaries can opt to participate for six months in the Seguro de Capacitación y Empleo (SCE) when the UI comes to an end. This option was introduced in June 2009, and according to Resolution No. 433 it was supposed to end in June 2010; nonetheless, this option remains in place. The SCE program provides a benefit equal to 225 pesos per month (75 US dollars).

UI beneficiaries receive not only the cash transfer described above, but also health insurance and family allowances. Health insurance is provided by the same company (usually a labor union) that covered the worker while she/he was employed.[21] Family allowances provide the following monetary benefits: a lump sum per child born, per child adopted, and marriage; a monthly transfer per children and children with disabilities; and an annual transfer per children attending school.

2.2.4 The 2006 Reforms to UI

In March 2006 two aspects of UI were reformed. First, the National Council of Employment, Productivity and Minimum Wage increased the minimum and maximum thresholds within which the UI benefit falls. Before March 2006, the thresholds were 150 and 300 pesos (50 and 100 US dollars, respectively), and since that date they have been 250 and 400 pesos (83 and 133 US dollars, respectively). The second reform is related to the eligibility requirement. Before March 2006, only workers with at least 12 months of contributions during the last 36 months were eligible. But since March 2006 the requirement is less stringent: 6 months of contributions during the last 36 months for workers who had an indefinite contract; 3 months of contributions during the last 12 months (or 12 months of contributions during the last 36 months) for workers with fixed-term contracts or those who had been hired by an employment service firm.

2.2.5 Fraud, Abuse, Compliance, "Leakages"

Before making any UI payments ANSES verifies whether the applicant's former employer effectively made contributions to the system, the applicant's prior earnings, and whether the applicant

[20] An example of UI beneficiaries who got the lump sum in the 1990s are sugar cane workers who lost their jobs when their firm became bankrupt and wanted to create a cooperative. But many others UI beneficiaries presented a fake or unrealistic business project. Because of this misuse, the Ministry of Labor became reluctant to pay UI as a lump sum.

[21] In Argentina, employers are legally mandated to make a monthly contribution to the health insurance fund. Labor unions have control over those funds and are responsible for providing coverage to the workers they represent.

is either receiving a pension or working in the formal sector. ANSES can check this information because every person with a pension or a formal job is included in the social security database. According to ANSES' employees, the agency checks these requirements every month. If ANSES finds that a UI beneficiary does not meet the requirements, then the person is disqualified from UI, and gets a fine equal to the amount of benefits that were irregularly received.[22] ANSES has a toll-free number where people can blow the whistle on UI beneficiaries who also have employment. But according to ANSES' employees this type of accusation is very rare. However, ANSES has no digital means to check whether the applicant is working in the informal sector. Furthermore, UI beneficiaries who also have informal employment are not penalized for doing so. Although we are not aware of any evidence, we suspect that these characteristics of the system increase incentives among UI beneficiaries to work in the informal sector where employment is harder to detect. In the EPH survey conducted during the third quarter of 2009, 33.8 percent of people who report receiving UI benefits also report having a job. ANSES and the Ministry of Labor inspect firms to detect employer non-compliance with labor and social security regulations. Until 2003, few inspections were conducted and there were coordination problems between the provincial labor inspection agencies and ANSES (Ronconi (2010)). Since 2003, the national Ministry of Labor has played a larger enforcement role, working more closely with ANSES, and both agencies devote more resources to enforcing compliance with social security regulations.

2.2.6 Employment Service and Training

The letter of the law establishes that UI beneficiaries have the obligation to participate in the training programs that the Ministry of Labor asks them to take. According to the interviews we conducted, many UI beneficiaries were asked to take a training course in the 1990s, but nowadays beneficiaries are not requested to do it. Beneficiaries can opt to enter the SCE program when UI comes to an end. This program provides employment counseling and training for low-skilled workers.

2.3 Active Labor Policies

In Argentina there are a large number of programs that provide cash assistance to low-income and unemployed workers. In this section we describe the three national programs that have the largest number of beneficiaries: Plan Jefes de Hogar (PJH), Plan Familias (PF) and Seguro de Capacitación y Empleo (SCE). Plan Jefes de Hogar was implemented in 2002 after Argentina suffered a severe political and economic crisis. Beneficiaries receive a monthly benefit equal to AR$ 150 pesos (50 US dollars) in exchange for working between 4 and 6 hours per day in community projects, although the work requirement is usually not enforced. To be eligible, people should be

[22] The person has the option to pay back that amount. If he/she does not payback, then the amount is deducted from any future benefit he/she might receive from ANSES.

unemployed, be head of household, and have children. The number of beneficiaries reached its peak in 2003 with more than 2 million beneficiaries, but the actual number of beneficiaries is less than 0.5 million in part due to the economic recovery and also because many beneficiaries migrated from the PJH to the PF and the SCE. Plan Familias was implemented in 2005 and provides income support to women with children who are in a vulnerable situation. The number of beneficiaries is almost 0.7 million and most of them were former participants of the PJH. Beneficiaries receive between AR$ 200 and AR$ 380 per month (67 and 127 US dollars, respectively) depending on the number of children they have. Beneficiaries have to vaccinate their children and send them to school. They receive AR$ 60 additional pesos per month (20 US dollars) if they choose to participate in training courses, complete primary or secondary school, or participate in community projects. The Seguro de Capacitacion y Empleo, implemented in 2006, provides training and counseling to participants who receive a monthly benefit equal to AR$ 225 for two years. Participants can also choose to finish primary or secondary school, or work in a community project. The number of individuals who migrated from PJH to SCE is approximately $130,000$.

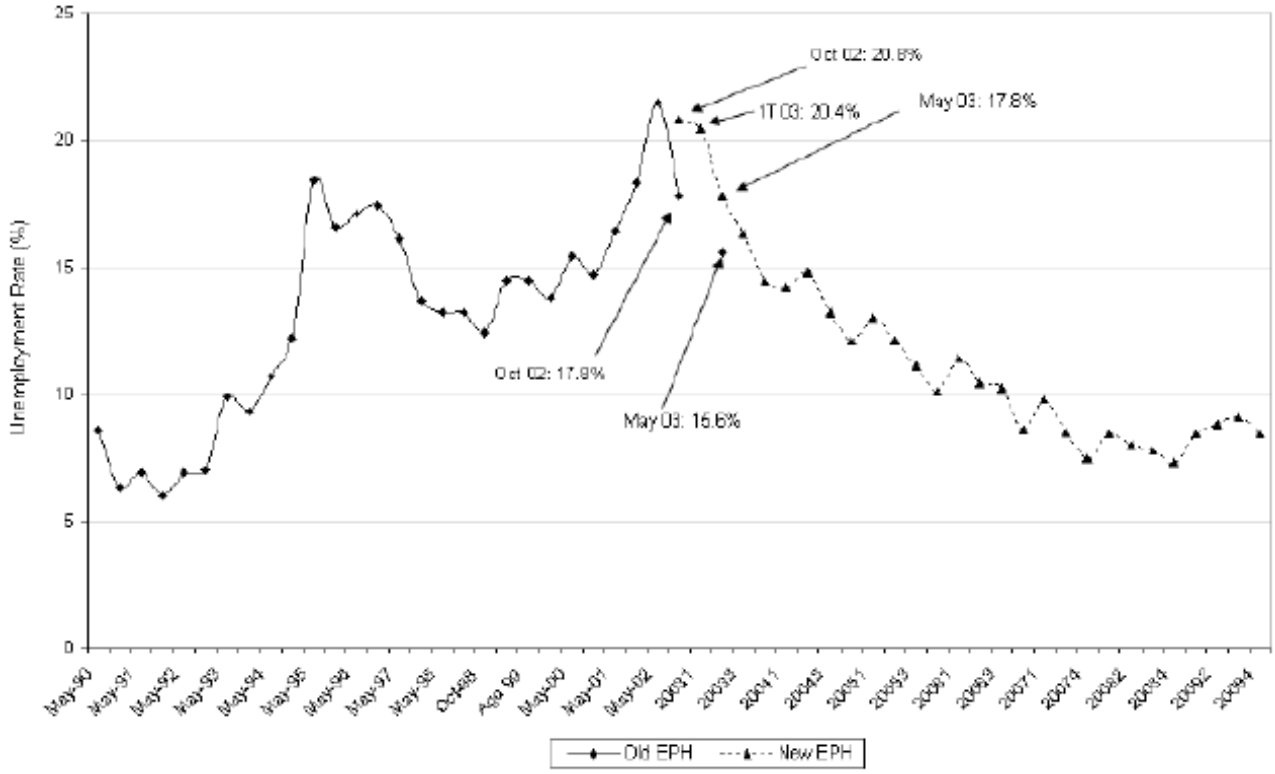
3 Argentina's Labor Market Characteristics

In this section we present some summary statistics on the Argentine labor market using the Household Survey (EPH), which began in 1974. From that date until May 2003, the EPH was conducted twice a year, in May and October. In the third quarter of 2003 the National Statistical Institute (INDEC) changed the household survey's methodology, and the EPH became a continuous survey with quarterly reports. The new methodology arose in response to the changing conditions in Argentina's labor market during the 1990s. During the 1970s and 1980s, the labor market was characterized by job security and formal employment in urban areas. These conditions, however, radically changed during the 1990s. In that decade the labor market displayed growing unemployment and job insecurity. The new household survey methodology incorporated several questions to capture the more dynamic forces acting in the labor market. As part of the modifications, the new household survey change the period of reference for the question about unemployment. Before the reform the question asked if the individual searched for a job in the week of reference of the survey, while after the third quarter of 2003 this question asks if the person is searching for a job in the month of reference of the survey. This new definition by itself increased the rate of unemployment.

3.1 Unemployment

Figure 1 shows the evolution of the unemployment rate in Argentina. The solid line in the picture shows the unemployment rate as measured by the old EPH while the dotted line depicts the unemployment rate captured by the new EPH. During the year 2002 and the beginning of 2003 both methodologies were applied. The figure shows the impact of the new definition of unemployment. This impact is around two points, while the unemployment rate in October 2002 was 17.8 percent

Figure 1. Unemployment Rate



Source: Authors' calculations using EPH.

using the old EPH, the new definition indicated a rate of 20.8 percent. Similar differences in the rate of unemployment can be seen for May 2003 using both methodologies. For consistency reasons we will present disaggregated statistics only for the period beginning in the second semester of 2003.

After the 2001 crisis, the unemployment rate was very high reaching 16.3 percent in the third quarter of 2003. From that point on the unemployment rate shows a negative pattern, declining to 7.3 percent in the fourth quarter of 2008. During the last year unemployment rose to 9.1 percent in the third quarter, only to fall to 8.4 percent in the fourth quarter of 2009.

The figure also shows some seasonality in the unemployment rate, which peaks in the first quarter and falls to a minimum in the fourth quarter of each year. Finally, notice that the survey was not conducted in the second quarter of 2007; however, INDEC has published some aggregate statistics for the quarter.

The definition of unemployment includes workers receiving social programs and workers receiving UI. Both are a small proportion of the unemployed. In our sample, workers receiving

Table 2. Composition of Unemployment

Age	Total	%	Male	%	Female	%
18 to 24	10,246,701	37%	5,131,806	38%	5,114,895	36%
25 to 34	6,873,793	25%	2,993,333	22%	3,880,460	27%
35 to 44	3,917,707	14%	1,619,954	12%	2,297,753	16%
45 to 54	3,431,399	12%	1,684,533	13%	1,746,866	12%
55 to 64	2,300,368	8%	1,412,422	11%	887,946	6%
65 and more	794,222	3%	536,150	4%	258,072	2%
Total	27,564,190	100%	13,378,198	100%	14,185,992	100%

Source: Author's calculations using the EPH from the third quarter of 2003 to the fourth quarter of 2009.

UI benefits are, on average, around 2.3 percent of unemployed workers, while those workers participating in a social program are, on average, around 1.8 percent of unemployed workers.[23] The average income of these workers was around AR$ 460 (153 US dollars) in the last semester of 2006. In the last two quarters of 2009 the average income of the unemployed with UI was AR$ 690 (230 US dollars).Of the eligible unemployed workers, around 40 percent receive UI benefits.

3.1.1 Composition of Unemployment

Table 2 shows the composition of unemployed workers when pooling all quarterly EPH surveys from the third quarter of 2003 until the fourth quarter of 2009. As is clear from the table, 49 percent of unemployed workers are males. Almost 40 percent of the unemployed are less than 25 years of age, and this percentage is more than 60 percent if we include workers less than 35 years of age. This characteristic is shared by both groups of workers, males and females.

We also compute unemployment composition by educational attainment. Table 3 shows a leading characteristic of the labor market in Argentina, that workers with a completed degree face a lower unemployment rate than comparable workers who did not complete their degrees. Except for those workers with higher education, unemployment rates are two digits rates at the beginning of the sample. These rates decrease through time until 2008. Those with less than primary education have, on average, an unemployment rate around 15 percent in 2004 and only 8.5 percent in 2008. These figures for the workers who completed their primary education are 13 percent and 7.7 percent, respectively. For the workers with more than primary but less than secondary complete education the average unemployment rate in 2004 was around 17 percent, decreasing to 11 percent in 2008. A similar trend can be observed for those with complete secondary and incomplete higher education. During 2009, all educational categories experience an increase in their rates of unemployment. Workers with completed higher education have the lowest rate of unemployment

[23]The coverage increased in the last years, partly because of the reforms to UI. The last available information (for 2010) shows that coverage is around 4.5 percent.

Table 3. Unemployment Rate by Education

Period	Less than Primary	Primary	Incomplete Secondary	Secondary	Incomplete Higher	Higher
2003:3	20.15	16.26	18.22	17.05	20.92	6.52
2003:4	16.44	13.90	18.77	14.98	17.14	6.46
2004:1	15.60	12.48	16.48	16.51	19.54	6.38
2004:2	15.81	14.38	17.77	16.54	17.64	6.00
2004:3	12.97	12.73	16.81	14.05	16.75	5.51
2004:4	14.76	12.31	16.42	11.51	13.46	5.05
2005:1	13.93	11.39	17.19	13.70	16.36	6.23
2005:2	12.81	11.40	15.70	12.60	14.42	5.65
2005:3	10.71	11.08	14.66	12.10	13.74	4.40
2005:4	9.14	10.15	15.10	10.55	10.51	3.92
2006:1	11.94	10.87	15.53	11.54	14.26	4.49
2006:2	9.85	9.15	13.89	11.66	13.49	4.16
2006:3	9.42	9.39	14.21	11.04	12.61	3.65
2006:4	10.27	7.77	10.58	10.92	10.55	2.82
2007:1	8.92	8.82	13.14	10.35	13.91	3.49
2007:3	9.20	6.57	11.51	9.32	10.43	3.84
2007:4	6.63	7.02	10.01	8.44	8.56	3.63
2008:1	6.52	7.78	11.11	8.99	10.56	4.45
2008:2	10.30	7.43	10.89	8.25	8.86	3.94
2008:3	8.80	7.42	11.05	7.78	9.01	3.83
2008:4	8.36	8.35	10.68	6.93	7.50	3.08
2009:1	9.74	7.33	11.13	8.65	11.33	4.32
2009:2	9.61	8.22	12.34	9.23	10.95	3.45
2009:3	12.54	9.02	12.90	8.88	10.07	4.23
2009:4	9.24	9.12	12.09	7.71	9.19	4.22

Source: Author's calculations using the EPH from the third quarter of 2003 to the fourth quarter of 2009.

of all categories in the whole sample period. For these workers the average unemployment rate during 2004 was only 5.7 percent and decreased to 4 percent in 2009. Both rates are well below the aggregate unemployment rates presented in Figure 1.

3.1.2 Unemployment Entry and Exit Rates

Table 4 shows the annual sample transition probabilities in the labor market among seven states. These transition probabilities were computed using the rotating panel of the household survey between the third quarter of 2003 and the third quarter of 2008. The first panel of the table shows the transition probabilities for all workers while the second and third panels disaggregate these probabilities for males and females, respectively. The "unemployed" row of the table shows that

Table 4. Annual Transition Matrix by Gender

	Out of Labor Force (t+4)	Salaried Formal (t+4)	Salaried Informal (t+4)	Unemployed (t+4)	Public Employee (t+4)	Self Employed (t+4)	Family Worker (t+4)
Out of Labor Force (t)	0.77	0.02	0.09	0.06	0.01	0.04	0.01
Salaried Formal (t)	0.03	0.75	0.12	0.03	0.04	0.03	0.00
Salaried Informal (t)	0.13	0.12	0.53	0.07	0.03	0.11	0.00
Unemployed (t)	0.27	0.09	0.23	0.25	0.03	0.11	0.00
Public Employee (t)	0.05	0.07	0.05	0.02	0.78	0.03	0.00
Self Employed (t)	0.10	0.04	0.13	0.04	0.02	0.66	0.01
Family Worker (t)	0.31	0.03	0.17	0.05	0.01	0.27	0.16
Males							
Out of Labor Force (t)	0.74	0.03	0.10	0.07	0.01	0.04	0.01
Salaried Formal (t)	0.02	0.77	0.11	0.03	0.03	0.04	0.00
Salaried Informal (t)	0.07	0.14	0.52	0.08	0.03	0.15	0.00
Unemployed (t)	0.15	0.11	0.28	0.26	0.03	0.17	0.00
Public Employee (t)	0.03	0.08	0.05	0.01	0.79	0.04	0.00
Self Employed (t)	0.05	0.04	0.14	0.05	0.02	0.70	0.00
Family Worker (t)	0.25	0.06	0.27	0.07	0.01	0.22	0.12
Females							
Out of Labor Force (t)	0.79	0.02	0.08	0.06	0.01	0.04	0.01
Salaried Formal (t)	0.05	0.72	0.12	0.02	0.06	0.02	0.00
Salaried Informal (t)	0.20	0.10	0.53	0.06	0.04	0.07	0.00
Unemployed (t)	0.37	0.08	0.19	0.25	0.04	0.07	0.01
Public Employee (t)	0.07	0.06	0.06	0.02	0.77	0.02	0.00
Self Employed (t)	0.20	0.02	0.11	0.04	0.02	0.59	0.02
Family Worker (t)	0.34	0.02	0.12	0.04	0.01	0.29	0.19

Source: Author's calculations using the EPH from the third quarter of 2003 to the fourth quarter of 2009

after four quarters 25 percent of the unemployed remain unemployed in our sample, while 27 percent of the unemployed exit the labor force. Only 9 percent of the unemployed move into a formal job after one year, and 23 percent exit to an informal job.

The picture is similar when disaggregating these transition probabilities by gender. Both males and females have almost the same persistence in unemployment, around 25 percent. However, women have a higher unemployment exit out of the labor force, 37 percent, after one year than men, 15 percent. Unemployed men show a higher transition probability into informal and self-employed jobs than women. While 28 percent of unemployed men move into an informal job after one year, only 19 percent of unemployed women; and 17 percent of unemployed men exit to self-employment compared with only 7 percent of unemployed women.

Table 5 disaggregate further the transition probabilities for males by age groups and Table 6 do the same but for females. Young unemployed men, less than 25 years of age, have a higher persistence in unemployment, 27 percent, compared with the other two age groups, and they have a higher transition probability of exiting to an informal job, at 32 percent. This group of workers has the same transition probability of moving out of the labor force as the older group of workers, 19 percent. The transition of unemployed men into self-employment showed in the previous table is basically explained by the exit into self-employment of unemployed workers in the older two groups. Women have a higher unemployment exit out of the labor force than men for all age groups. The persistence in unemployment for women is very similar to the one described for men. Women in the older two groups have a lower probability of moving out of unemployment and into self employment than men.

Overall, the evidence presented in this section shows what could be described as a stagnant labor market, with unemployment implying severe hardship. After one year in unemployment more than 50 percent of workers remain in unemployment or move out of the labor force. The situation is worse for women than for men, as 62 percent of women remain in unemployment or exit the labor force after one year, compared with 41 percent of men. Only 9 percent of workers get a job in the formal sector of the economy. This figure is slightly higher for men (11 percent) than for women (8 percent).

3.1.3 Duration of Unemployment

Table 7 summarizes the unemployment duration using the household survey's questionnaire for workers between 15 and 65 years old. As can be seen from the table, more than 20 percent of the unemployed search for a job for more than one year over the whole period analyzed. The high unemployment rates at the beginning of the period are summarized by those who searched for more than one year, which were almost half of the unemployed, 47.3 percent, compared with only 12 percent who were searching less than one month. In 2009, the duration of unemployment was of three months or less for around 40 percent of the unemployed, while it was longer than one year for 30 percent of the unemployed.

Figure 2 shows the Kaplan-Meier survival estimation curve for our sample.

Mean duration is about half a year (26 weeks), and the median survival time is around 32 weeks. These figures describe a labor market where those who enter unemployment have a difficult time getting out of it. Figure 3 shows the proportion of workers seeking for a job fore more than one year by age groups. The figure depicts what can be described as the proportion of "long-term unemployment" workers by age groups. Around 47 percent of workers between 26 and 55 years old were searching for a job for more than one year in the third quarter of 2003, while at the end of our sample period this figure was around 32 percent. The older group of workers show a similar

Table 5. Annual Transition Matrix for Males by Age

Males, 14 to 24	Out of Labor Force (t+4)	Salaried Formal (t+4)	Salaried Informal (t+4)	Unemployed (t+4)	Public Employee (t+4)	Self-Employed (t+4)	Family Worker (t+4)
Out of Labor Force (t)	0.75	0.03	0.11	0.07	0.01	0.02	0.01
Salaried Formal (t)	0.04	0.67	0.16	0.08	0.02	0.03	0.00
Salaried Informal (t)	0.13	0.14	0.50	0.12	0.02	0.08	0.01
Unemployed (t)	0.19	0.12	0.32	0.27	0.03	0.06	0.00
Public Employee (t)	0.08	0.09	0.12	0.06	0.61	0.03	0.00
Self-Employed (t)	0.16	0.07	0.29	0.08	0.02	0.36	0.03
Family Worker (t)	0.29	0.05	0.33	0.05	0.01	0.14	0.13
Males, 25 to 44							
Out of Labor Force (t)	0.53	0.05	0.15	0.12	0.04	0.11	0.01
Salaried Formal (t)	0.01	0.78	0.12	0.02	0.03	0.04	0.00
Salaried Informal (t)	0.03	0.15	0.55	0.07	0.03	0.17	0.00
Unemployed (t)	0.08	0.13	0.29	0.24	0.03	0.21	0.00
Public Employee (t)	0.01	0.08	0.05	0.01	0.81	0.04	0.00
Self-Employed (t)	0.02	0.06	0.17	0.04	0.02	0.69	0.00
Family Worker (t)	0.11	0.12	0.15	0.09	0.02	0.40	0.11
Males, 45 to 65							
Out of Labor Force (t)	0.77	0.01	0.05	0.06	0.01	0.09	0.00
Salaried Formal (t)	0.02	0.78	0.09	0.02	0.04	0.05	0.00
Salaried Informal (t)	0.06	0.12	0.50	0.06	0.03	0.21	0.00
Unemployed (t)	0.19	0.06	0.18	0.25	0.02	0.29	0.00
Public Employee (t)	0.04	0.07	0.03	0.01	0.81	0.04	0.00
Self-Employed (t)	0.06	0.03	0.10	0.05	0.02	0.75	0.00
Family Worker (t)	0.25	0.06	0.10	0.13	0.00	0.40	0.07

Source: Author's calculations using the EPH from the third quarter of 2003 to the fourth quarter of 2009.

Table 6. Annual Transition Matrix for Females by Age

Females, 14 to 24	Out of Labor Force (t+4)	Salaried Formal (t+4)	Salaried Informal (t+4)	Unemployed (t+4)	Public Employee (t+4)	Self-Employed (t+4)	Family Worker (t+4)
Out of Labor Force (t)	0.79	0.02	0.08	0.08	0.01	0.01	0.01
Salaried Formal (t)	0.11	0.65	0.14	0.07	0.02	0.01	0.00
Salaried Informal (t)	0.26	0.12	0.44	0.10	0.03	0.04	0.01
Unemployed (t)	0.36	0.09	0.20	0.27	0.03	0.04	0.01
Public Employee (t)	0.23	0.07	0.10	0.06	0.55	0.01	0.00
Self-Employed (t)	0.26	0.03	0.22	0.10	0.02	0.32	0.03
Family Worker (t)	0.42	0.02	0.16	0.08	0.00	0.16	0.16
Females, 25 to 44							
Out of Labor Force (t)	0.72	0.02	0.11	0.07	0.02	0.05	0.01
Salaried Formal (t)	0.04	0.74	0.12	0.02	0.06	0.02	0.00
Salaried Informal (t)	0.17	0.11	0.55	0.06	0.05	0.06	0.00
Unemployed (t)	0.34	0.08	0.20	0.24	0.06	0.07	0.00
Public Employee (t)	0.07	0.06	0.07	0.02	0.77	0.02	0.00
Self-Employed (t)	0.18	0.03	0.11	0.04	0.03	0.58	0.02
Family Worker (t)	0.27	0.02	0.13	0.01	0.02	0.34	0.21
Females, 45 to 65							
Out of Labor Force (t)	0.84	0.01	0.06	0.03	0.01	0.05	0.00
Salaried Formal (t)	0.05	0.71	0.11	0.01	0.09	0.03	0.00
Salaried Informal (t)	0.22	0.06	0.57	0.04	0.03	0.09	0.00
Unemployed (t)	0.45	0.03	0.16	0.22	0.02	0.11	0.01
Public Employee (t)	0.07	0.06	0.04	0.01	0.81	0.02	0.00
Self-Employed (t)	0.20	0.01	0.08	0.02	0.01	0.64	0.02
Family Worker (t)	0.35	0.02	0.06	0.01	0.01	0.38	0.18

Source: Author's calculations using the EPH from the third quarter of 2003 to the fourth quarter of 2009.

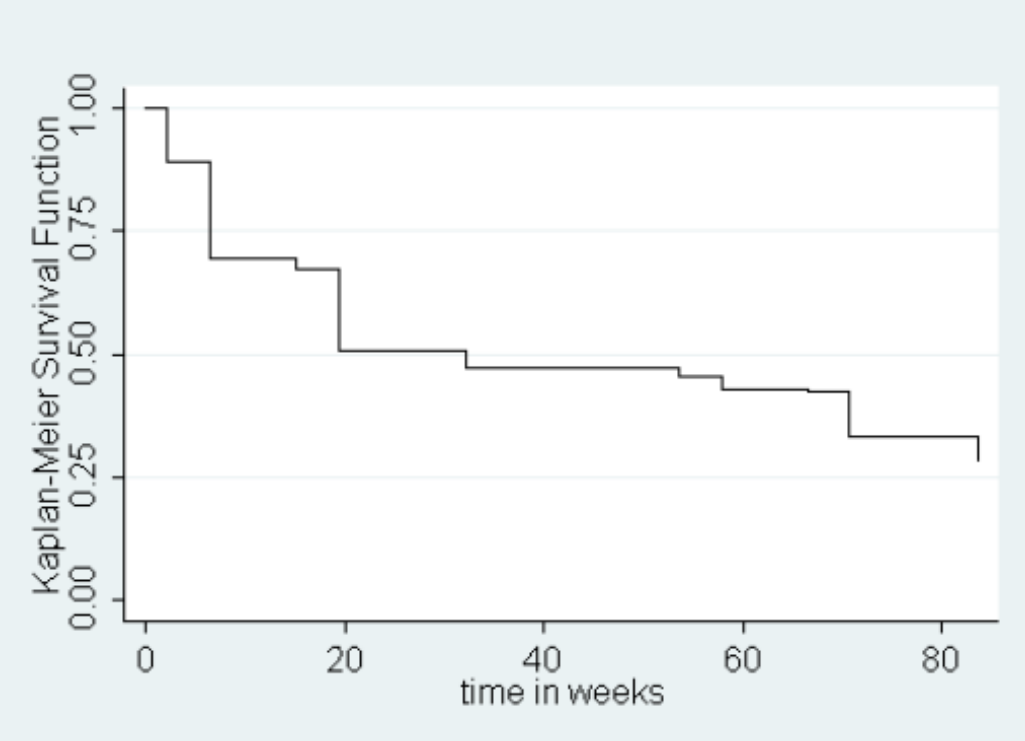
Table 7. Unemployment Duration

Period	How long have you been searching for a job?				
	less than 1 month	from 1 to 3 months	from 3 to 6 months	from 6 to 12 months	more than 1 year
2003:3	12.4%	20.5%	11.8%	8.1%	47.3%
2003:4	11.2%	21.3%	12.5%	17.1%	37.9%
2004:1	18.0%	22.9%	9.0%	18.1%	32.1%
2004:2	15.8%	22.8%	8.5%	16.5%	36.4%
2004:3	13.5%	25.5%	17.8%	15.4%	27.8%
2004:4	18.8%	22.7%	11.5%	19.9%	27.2%
2005:1	16.8%	31.3%	13.2%	6.4%	32.4%
2005:2	18.9%	25.9%	13.0%	11.4%	30.8%
2005:3	18.5%	22.1%	8.4%	10.2%	40.7%
2005:4	18.9%	21.8%	13.6%	14.4%	31.3%
2006:1	17.9%	28.0%	14.7%	11.8%	27.6%
2006:2	7.0%	30.3%	17.5%	7.8%	37.3%
2006:3	21.3%	26.3%	10.3%	6.6%	35.4%
2006:4	12.6%	30.4%	14.1%	11.9%	31.0%
2007:1	15.8%	35.5%	14.8%	8.5%	25.4%
2007:2	19.3%	35.0%	15.9%	10.5%	19.3%
2007:4	11.3%	30.8%	12.8%	9.4%	35.7%
2008:1	21.0%	37.2%	14.1%	3.5%	24.2%
2008:2	20.2%	25.1%	13.0%	12.1%	29.7%
2008:3	9.9%	20.4%	14.8%	13.0%	41.9%
2008:4	17.7%	24.8%	8.9%	18.8%	29.8%
2009:1	18.6%	35.5%	13.9%	11.2%	20.8%
2009:2	17.0%	28.8%	23.4%	11.0%	19.7%
2009:3	13.0%	19.3%	20.5%	21.6%	25.6%
2009:4	16.9%	21.5%	13.5%	18.0%	30.2%

Source: Author's calculations using the EPH from the third quarter of 2003 to the fourth quarter of 2009.

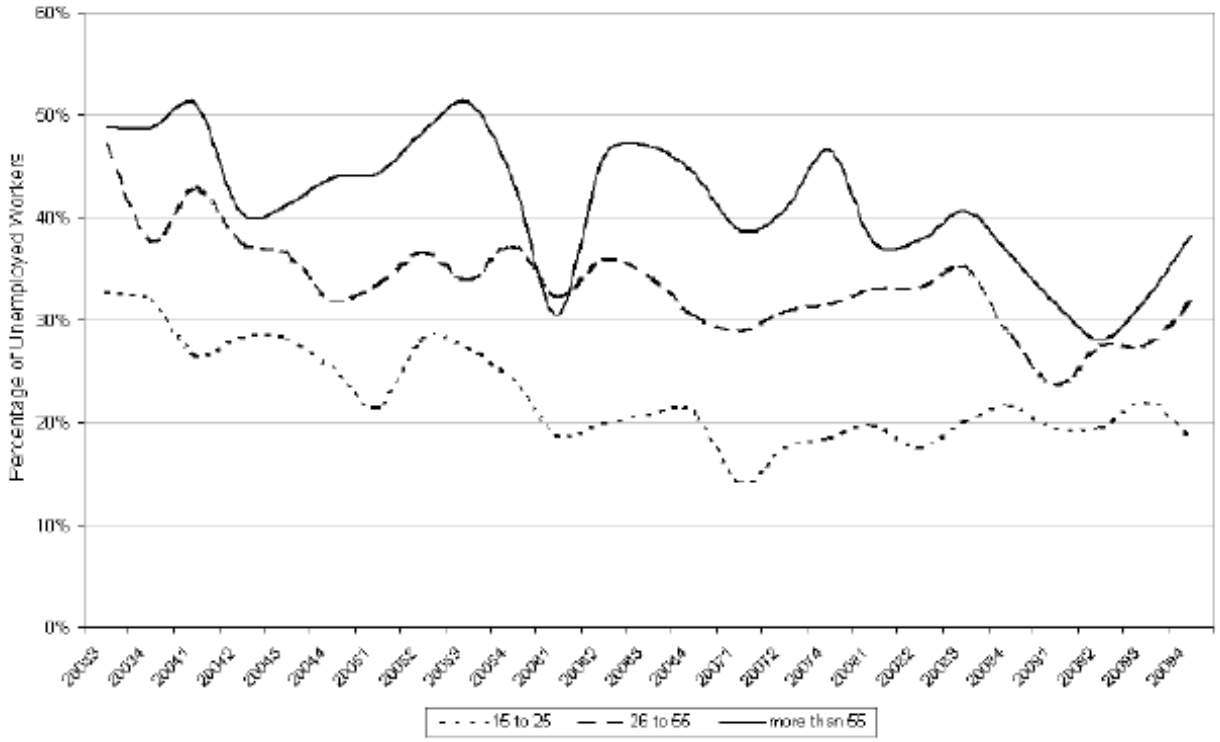
Note: Duration computed for workers between 15 and 65 years old using the EPH from the third quarter of 2003 to the fourth quarter of 2009.

Figure 2. Unemployment Survival Curve



Source: Authors' calculations using EPH.

Figure 3. Long-Term Unemployment by Age



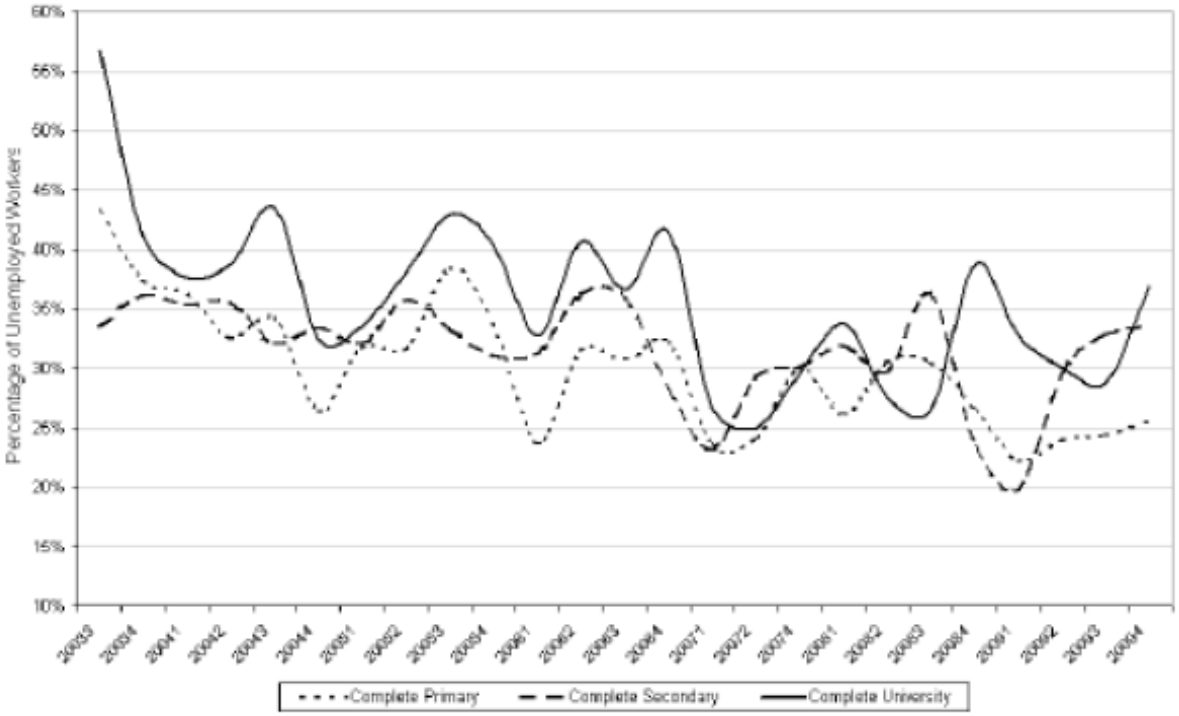
Source: Authors' calculations using EPH.

pattern over time, although the proportion of workers searching for jobs for more than one year is greater than in the other two age categories over the whole sample period.

Overall, this empirical evidence shows that all three age groups have a high percentage of workers searching for a job for more than one year at the beginning of the period, with this proportion declining over time.

We also compute unemployment duration by educational categories. Figure 4 shows the proportion of unemployed workers seeking for a job for more than one year by educational attainment. The figure shows that the proportion of workers with complete primary education searching for a job for more than one year is around 32 percent at the beginning of the period and around 25 percent during 2009. For the group of workers with higher education the proportion of workers searching for a job for more than one year is on average 38 percent during 2004 and 2005 and almost 32 percent during 2009. Even though the unemployment rate for those workers with primary education is much higher than that for the group with complete university education, the

Figure 4. Long-Term Unemployment by Educational Attainment



Source: Authors' calculations using EPH.

proportion of workers in both groups looking for a job for more than one year is very similar (see Table 3).

3.1.4 Formal and Informal Employment

Finally, we characterize the working population according to sectors. Table 8 describes people working in the informal sector of the economy (defined as those workers not covered by social security) and in the formal sector. We divided the formal sector into those individuals working less than 6 months in their jobs (these are the workers not covered by the UI system) and those workers with more than 6 months of tenure, who are the covered workers. The last two columns of the table shows the self employment divided in formal and informal workers.[24]

Informal workers were about half the working population at the beginning of the period analyzed and around 35 percent in the third quarter of 2009. The formal covered sector, which was 47 percent in the third quarter of 2003, is around 60 percent in the last quarter of data. Our

[24]Informality among self-employed workers is not directly identifiable using EPH. Nevertheless, some results for a particular wave (2006) show that informality is higher for less skilled and low- tenured self-employed workers. Then, we considered as informal all the self-employed who have less than secondary education and less than 6 years of tenure on the job.

definition of formal worker does not include workers receiving social programs. More than half of the more or less 2 million self-employed, per quarter, are informal workers.

Overall, the evidence presented in this section describes a labor market characterized by a declining unemployment rate over time but also by a high proportion of unemployed workers that remain in unemployment or move out of the labor force even after one year of actively seeking for a job. This last feature does not depend on age or educational attainment. In terms of employment there is a growing formal sector over our sample period but also a significant informal sector in the economy.

4 Impact Evaluation Methodology

In this section we describe our empirical strategy to isolate the causal effects of the UI and SP policies on several labor market outcomes. Our identification strategy rests on exploiting the time and cross-sectional variations in UI benefits and severance payments transfers and using a regression discontinuity approach to measure the causal effect of these two instruments on unemployed and employed workers.

We measure the effects of UI and SP on the duration of unemployment and on the probability of transiting from unemployment to informality in the case of unemployed workers. For the effects of these two instruments on employed workers, the outcome variable is the separation probability.

We use both administrative data and household survey data to provide estimates of the impact of both UI and SP on the outcome variables.

4.1 Effects on Unemployed Workers

4.1.1 Duration of Unemployment

The first and most obvious outcome is the impact of UI and SP on the duration of unemployment. As mentioned in the introduction, any UI benefit can be decomposed into an unconditional transfer (a welfare-improving liquidity provision) and a reduction in labor income (a welfare-reducing substitution effect or "moral hazard effect"). Given that workers receive UI only if they are unemployed, this transfer reduces the income gain of being employed, generating a substitution effect. In this view, UI benefits increase the duration of unemployment. We estimate the liquidity and substitution effects on unemployment duration using the SP transfers to measure the liquidity effect and the UI benefits to compute the substitution effect.

As a starting point, consider the following Cox proportional hazard model of the duration of unemployment in which we will include two type of variables: some policy variables, y, and covariates, x.

$$\theta(t_u|x) = \lambda(t_u)\exp(x\beta + y\gamma)$$

Table 8. Informal and Formal Workers

Period	Informal Workers	Formal less than 6 months	Formal more than 6 months	Self-Employed Informal	Formal
2003:3	49.42%	3.15%	47.12%	54.60%	45.40%
2003:4	49.30%	3.61%	46.82%	57.17%	42.83%
2004:1	48.49%	3.35%	48.07%	55.61%	44.39%
2004:2	47.58%	3.46%	48.73%	54.41%	45.59%
2004:3	47.06%	3.72%	49.09%	54.52%	45.48%
2004:4	48.34%	3.79%	47.71%	53.04%	46.96%
2005:1	46.87%	3.55%	49.41%	54.16%	45.84%
2005:2	46.40%	3.51%	49.88%	53.13%	46.87%
2005:3	46.09%	4.09%	49.71%	54.93%	45.07%
2005:4	45.21%	3.92%	50.74%	54.26%	45.74%
2006:1	43.81%	3.51%	52.44%	54.43%	45.57%
2006:2	43.53%	3.72%	52.62%	51.26%	48.74%
2006:3	42.46%	4.03%	53.25%	52.39%	47.61%
2006:4	42.55%	4.40%	52.77%	51.98%	48.02%
2007:1	41.42%	4.22%	54.07%	51.93%	48.07%
2007:2	40.65%	4.56%	54.72%	51.73%	48.27%
2007:4	39.59%	4.94%	55.14%	48.57%	51.43%
2008:1	37.77%	4.69%	57.20%	51.30%	48.70%
2008:2	36.53%	5.08%	58.05%	52.31%	47.69%
2008:3	37.34%	4.60%	57.83%	50.55%	49.45%
2008:4	37.55%	4.14%	58.02%	52.13%	47.87%
2009:1	36.42%	3.61%	59.80%	50.79%	49.21%
2009:2	35.64%	3.57%	60.55%	51.33%	48.67%
2009:3	35.77%	3.46%	60.63%	50.52%	49.48%
2009:4	36.40%	3.60%	59.67%	48.99%	51.01%

Source: Author's calculations using the EPH from 2003.3 to 2009.4.

where $\lambda(t_u)$ is the baseline hazard, the exit probability from unemployment to employment, that is unspecified and can take any form.[25] This distinguishes the Cox model from other methods (such as the Weibull PH model) in which $\lambda(t_u)$ is assumed to have an specific distribution. Covariates, x, will include a polynomial on age, unemployment rates, tenure, occupation and industry of past job, sex, a spline on wages, and other variables related to personal, household and labor market characteristics.

Policy variables, y, are defined to exploit sharp differences in UI benefits and SP transfers due to eligibility conditions and due to exogenous changes in the labor market legislation. In this sense, and depending on the particular exercise, we use dichotomous variables that identify eligibility of severance pay and unemployment insurance benefit; a binary indicator to identify those workers more than 45 years of age; a dummy variable to identify those workers that entered the firm before February 2002; and two sets of time dummies to identify the periods in which the UI and SP changed.

This estimation strategy is related to both Card, Chetty and Weber (2007) and (2004). In the first case, a regression discontinuity approach is followed and a flexible baseline hazard applied. In the second case, a difference-in-difference approach is followed in which treatment variables are included in the baseline hazard. In this case we can take advantage of both identification procedures.

We implement all estimations using both administrative and household survey data, which are described below.

4.1.2 Unemployment and Informality

The second and very important outcome is the probability of transiting from unemployment to informality. We estimate the effects of UI and SP policies over the probability of going from unemployment to informality using a competing-risks duration model. Additionally, this procedure allows us to address not only the probability of transition from unemployment to informality but also the transition to different types of jobs: formal and self-employed jobs and out of the labor force.

Consider a competing risk analysis distinguishing four different destination states: formal employment in the first postdisplacement job, informal employment in the first postdisplacement job, self-employment in the first postdisplacement job and out of the labor force. This kind of model relax the assumption that the hazard function does not depend on the destination state assumed in duration models and consider instead a competing risks formulation in which four competing risks determine the duration of unemployment. In particular, we estimate a competing risk

[25] Transitions to inactivity will be censored spells. In administrative data we are not able to identify these cases. Additionally, in Argentina there are important flows from out of the labor force to participation, suggesting that inactivity is frequently not an absorbing state and that inactive can be seen as discouraged unemployed.

model using Fine and Gray (1999) approach. They posit a model for the hazard of the subdistribution for the failure event of interest, known as the subhazard. The model is semiparametric in that the baseline subhazard (that for covariates set to zero) is left unspecified, while the effects of the covariates are assumed to be proportional. Competing-risks regression performed in this manner is quite similar to the Cox regression, and we estimate a subhazard for each of the destination states mentioned above.

We include both policy, y, and exogenous covariates, x, in our estimations. As in the duration of unemployment exercise, policy variables are defined exploiting the differences in UI benefits and SP transfers due to eligibility conditions and due to exogenous changes in labor market legislation. This estimation is performed using only the household survey data set.

4.2 Effects on Employed Workers

Another outcome of these policies is separation probability. Particularly, severance pay is a firing cost that can reduce separations. In fact, this was the argument behind the shift in severance pay in 2002: to reduce layoffs at a particularly critical time.

Additionally, the unemployment insurance benefit (particularly a generous one) could increase separations: effort on the job could be reduced given that unemployment insurance is available. While this is perhaps of second-order importance in the analysis of unemployment insurance policy, it could be important to identify its effect.

Using the Permanent Household Survey (EPH) we constructed a panel data set to study the impact of the SP reform of 2007. We took all formal workers, defined as those workers that were covered by social security, in the fourth quarter of 2006 and follow them through the first quarter of 2007, the fourth quarter of 2007 and the first quarter of 2008. We define two groups of workers. The so-called treatment group is composed of workers hired before February 2002, and the control group is composed of workers hired after February 2002. The treatment group of workers is affected by the change in the SP legislation.

We estimated a difference-in-differences model specified as a two-way fixed effect linear regression model:

$$\text{Separation}_{it} = \alpha_i + \lambda_t + \beta I_{it} + \pi I(E \text{ before Feb. } 2002) + X'_{it}\gamma + u_{it}, \quad i = 1, \cdots, N; \;\; t = 1, 2. \tag{1}$$

where the outcome variable, Separation, adopts the value one if the individual goes from formal worker in the fourth quarter of 2006 (2007) to be unemployed, inactive, informal worker or changed her job in the formal sector during the first quarter of 2007 (2008). The variable adopts the value zero for all other cases. α_i is an individual fixed effect, λ_t is a time effect, $I(E \text{ before Feb. } 2002)$ is an indicator variable adopting the value one if the worker was hired be-

fore February 2002, X_{it} are covariates and u_{it} is the residual term. $t = 1$ indicates the period before the SP reform. I_{it} is the treatment indicator variables adopting the value one for those workers hired before February 2002 in the quarters after the implementation of the SP reform. Therefore, the parameter β measures the effect of the SP reform on the separation probability. We estimate this model using both least squares and Logit procedures.

We also analyze the effect on the separation probability of the UI legislation reform of March 2006. For this, we use the EPH and take all formal workers in the second quarter of 2005 and follow them through the third quarter of 2005. We also consider all formal workers in the second quarter of 2006 and follow them through the third quarter of 2006. Therefore we have two quarters before the UI reform and two quarters after that reform. We pooled this cross-section sample over time. The outcome variable is a binary indicator that we called separation, adopting the value one if the individual goes from formal worker in the second quarter of 2005 (2006) to being unemployed, inactive, an informal worker or changed her job in the formal sector during the third quarter of 2005 (2006). We measure the effect of the unemployment insurance reform of March 2006 on the probability of separation using an indicator variable adopting the value one for those workers that are eligible to receive UI after March 2006. The coefficient on this variable measures the effect of the UI reform of March 2006 on the probability of separation. As pointed out before, we estimate this model using both least squares and Logit procedures.

The impact of both instruments, SP and UI, on the probability of separation is estimated using only the household survey data set.

4.3 Identification Strategy

This section describes the differences in eligibility conditions and in the labor market legislation that allow us to isolate the effects of UI and SP policies on the labor market outcomes mentioned in the previous section.

4.3.1 Time Variation: Changes in Legislation

As was explained in Section 2, unemployment insurance benefits changed in many dimensions after March 2006. The reform of 2006 was based on the fact that the maximum and minimum values of the unemployment insurance benefit needed an update. The high inflation in prices and wages after the 2001 crisis generated a progressive decline in replacement rate, forcing the government to increase these maximum and minimum thresholds in March 2006. The average annual inflation rate in Argentina between 1991 and 2001 was only 4 percent while, after the 2001 crisis, in 2002 and 2003, this figure rose to about 20 percent per year. During the recovery years, between 2004 and 2005, the annual inflation rate was back in single digits, 7 percent on average.

On the other hand, severance payment levels also changed during this period in 2005 and 2007. As was stressed before, when severance pay was doubled, it included the condition that

when unemployment again reached 10 percent, the temporary rise in firing cost would disappear automatically. The release of the unemployment rate at the end of 2006 generated the necessary conditions for reducing severance payment by 33 percent (from 1.5/12 to 1/12 wages per year of tenure) for those workers attached to a firm before February of 2002.

The stable economic conditions in Argentina beginning in 2004, two years before the reforms to both UI and SP were implemented, suggest that the change in both policies could be seen as an exogenous shock to workers' incentives. If that is the case, policy variables described in the previous section will identify the effects of both reforms on the labor market outcome variables.

4.3.2 Cross-Sectional Variation: Eligibility for Benefits

Besides changes through time, our strategy benefits from sharp discontinuities in the eligibility for different schemes of unemployment insurance and severance pay.

Firstly, unemployment insurance (up to 2006) could be demanded by those workers with more than 12 months of formal employment in the last three years. That is, workers that have been working for less than 12 months will not have access to unemployment insurance benefits, while those with 13 or more months will have a benefit. This sharp discontinuity would allow us to identify the effect of UI eligibility, in the vein of Card, Chetty and Weber (2007).[26]

Also, workers more than 45 years of age are benefited by an extension of UI of six months. In this case there is also a discontinuity that changes not the eligibility for the benefit but its duration.

Additionally, young permanent workers with 24 contributions in the last three years are entitled to 8 months of UI transfers, while for those with 12 to 23 months of contributions are eligible for 4 months; this is an additional discontinuity that will be used to assess the effect of duration.

On the other hand, severance pay also presents a sharp discontinuity: those workers benefited by the increase in severance pay are the ones that entered a firm before February 2002. Thus, the impact of the severance pay increment can be identified by using this variation in a panel, in which both tenure and eligibility for the higher severance payment could be identified.

5 Impact Evaluation using Administrative Data

5.1 Administrative Data Description

Administrative data consist of several sources and databases that were combined to allow duration analysis. These sources are the SIPA database, which has monthly data on declared jobs by firms (private wage earners), the declared Self-Employed database, and the UI Beneficiaries database. We also were able to construct an additional database with demographic information on workers.

[26] They estimate the sensitivity of job search behavior to transfers using sharp discontinuities in eligibility for severance pay and extended unemployment insurance (UI) benefits in Austria, after the 1989 reform.

It is important to emphasize that this source allows us to follow only declared jobs. Thus, it is imposible for us to distinguish between unemployment and an informal job. For this reason, unemployment spells tend to be longer.

All these databases have two type of identification numbers: CUIL, which identifies the worker, and CUIT, which identifies the firm. Using the CUIL we were able to combine databases and follow the same worker in different situations, as wage earner, self-employed or unemployed.

We used a particular version of the SIPA database, which follows jobs (workers in a firm), providing the level of wages for that job at the monthly level. From this source we were able to construct a full working history of workers, month by month, from January 1995 to December 2009. This allowed us to generate variables related to jobs prior to UI and to identify reemployment jobs.

The Self-Employed database has only an identification variable by month (from 1995 to 2009), which is 1 if the worker has declared himself as self-employed in that month and paid the contributions. This source is important for analyzing reemployment: if a worker is observed as self-employed in any period after the beginning of UI, he is considered reemployed.

The UI Beneficiaries database is used for administrative purposes. It has information of all the UI transfers for each worker, and additional relevant variables, such as pre-unemployment wages, age of the worker, gender and others.

Finally, using all these variables we were able to generate a database for duration analysis. This database, the Unemployment Duration database, follows each period of UI transfer and gathers information about the last job, pre-unemployment work history and about reemployment job. In particular, we computed completed durations per spell as the difference in months between the period of the layoff and the period in which we first observe the worker as reemployed (both as wage earner or self-employed). Using all the administrative sources, variables of characteristics of the workers were constructed, providing information such as age, gender, number of children, presence of spouse, etc. We describe this database in detail in the Appendix.

In what follows we will first describe the UI Beneficiaries database and the characteristics of the workers covered by UI. Then we will go through our impact evaluation exercises.

5.1.1 The Variables of the Unemployment Insurance Beneficiaries Database

The database is a simplified version of the one that the Agency uses for administrative purposes. It has not been treated for consistency by the Ministry of Labor or any other institution. This implies that it is highly probable that several variables are measured with error.

Each record in this dataset is a transfer for the worker, that is a worker-month observation. The variables of this database include:

Table 9. Unemployment Beneficiaries, by Number of Covered Unemployment Spells

Number of spells	Beneficiaries	Proportion
1	987 954	93%
2	64 549	6%
3	4 268	0%
4	223	0%
5	9	0%
Total	1 057 003	100%

Source: Unemployment Beneficiaries Database.

Note: Spells: number of times a worker has access to an UI spell.

Worker's identification variable which is the CUIL, that is a code that allows us to merge this database with others of the Social Security System.

Worker's characteristics variables including age, sex, whether the worker has a spouse, number of children, type of last employment (permanent or construction worker) and location.

Other household characteristics including whether the spouse is working or perceiving an unemployment benefit or subsidy, and whether the spouse is male and unable to work.

Benefit duration variables including total number of months of entitlement and the number of month of the UI transfer.

Amount variables including the amount of the basic benefit, the amount of family transfers, total transfer paid, and the reference wage for the spell (pre-unemployment wage, which is used to determine the level of benefits).

5.1.2 Profile of Unemployment Insurance Beneficiaries

There are around one million beneficiaries covered by unemployment insurance from 2001 to 2010. Most of these beneficiaries have been covered only once during the period that we analyze. Only around 7 percent of workers experienced more than one spell of unemployment in which they were covered by the unemployment insurance system.

Around 15 percent of beneficiaries were less than 25 years of age when they began the spell, while 38 percent were between 35 and 55 years of age. Coverage of older individuals is much smaller. It is worth noting that the number of beneficiaries tends to increase rapidly by age, peaking at age 27 and decreasing for older workers. The low coverage of the very young could be related to eligibility conditions. In particular, more than 12 months of formal work (6 months after 2006) are required for workers to be eligible for unemployment insurance.

Table 10. Unemployment Beneficiaries, by Age Groups and Gender

Age	Total	%	Male	%	Female	%
18 to 24	155 332	15%	108 498	14%	46 834	16%
25 to 34	438 066	41%	304 009	40%	134 046	46%
35 to 44	249 379	24%	187 581	25%	61 792	21%
45 to 54	142 996	14%	107 466	14%	35 524	12%
55 to 64	65 875	6%	53 357	7%	12 514	4%
65 and more	5 100	0%	4 331	1%	769	0%
Total	1 056 748	100%	765 242	100%	291 479	100%

Source: Unemployment Beneficiaries Database.

Note: Observations by age at the begining of the spell and gender.

Table 11. Beneficiaries by Sex

Sex	Beneficiaries	Percent
Men	765,242	72.4
Women	291,479	27.6

Source: Unemployment Beneficiaries Database.

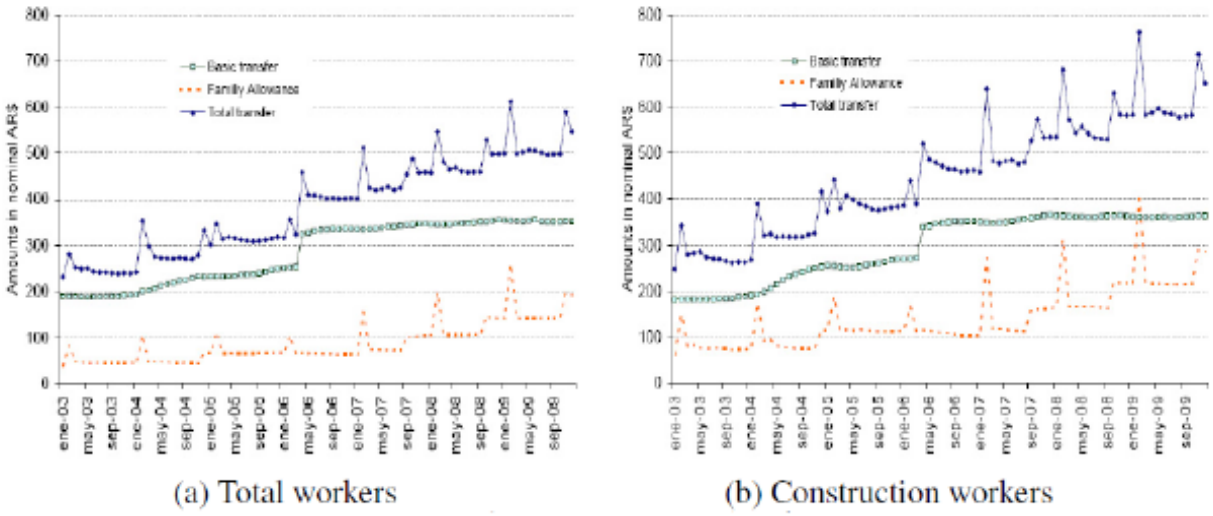
Consistent with the findings using the EPH, more than 73 percent of the beneficiaries are men.

5.1.3 Evolution of Benefits and Total Transfers

The next step is to characterize the transfer of the unemployment benefit. The total transfer has two components: the basic unemployment benefit and additional family-related transfers, which are positive if the beneficiary has a spouse and/or children. The mean transfer in the first quarter in 2006 was AR$ 331 (around US$100), consisting of a mean of AR$ 252 of benefits and AR$ 78 of family transfers. These transfers are low when we compare them with the mean of wages: AR$ 1,600 (around US$500) for formal employed workers. The displaced had, according to the Beneficiary database, a much lower wage: the reference wage is AR$ 1,060 for 2006. If we use this last value, we compute the replacement rate to be close to 25 percent, which is a very low transfer compared to the mean OECD unemployment benefit.

In Figure 5 we plot the mean transfer and its components: benefits and family transfers. It is important to note that between 2003 and 2005 mean transfers tend to increase due to a mean increase in wages. Nevertheless, the 28 percent increase in April 2006 is related to a change in the parameters of the policy, when both minimum and maximum transfer levels were increased. This is the change that we are planning to exploit in our impact evaluation of the policy.

Figure 5. Level of Benefits: Nominal Mean Benefits



Source: Unemployment Beneficiaries Database.
Note: Total transfer is the sum of basic transfer and family allowances.

Note also that this jump in benefits implies a change in total transfer: this value increased by almost 30 percent from the first quarter of 2006 to the first quarter of 2007.

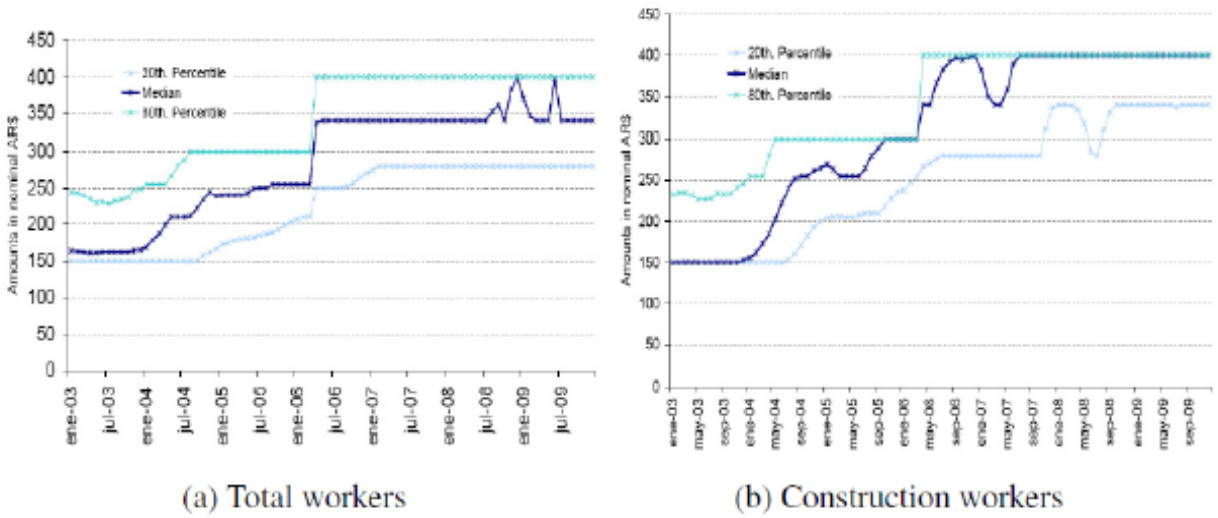
When we analyze the evolution of the benefit level by percentile (see Figure 6) the change in the policy parameters is even more apparent: the 20th percentile jumps from 210 to 250, increasing 19 percent; while both median benefit and 80th percentile increased by 33.

5.1.4 Duration Analysis

We turn now to the duration of the unemployment benefit provided to the worker. It is important to stress that this duration is only computed through the data provided by the Beneficiaries database. This source does not provide information on whether beneficiaries had found a job. In principle, the worker should declare when he finds a job, at which time unemployment benefits are supposed to end. Additionally, the agency should control the employment status of the beneficiary. Nevertheless, nothing guarantees that this is done efficiently: workers can hide their new employment and the agency would generally spend some time in cross-checking databases.

The distribution of final duration of spells of covered unemployment is analyzed in Figure 7. Peaks at 4, 8 and 12 months are related to the most frequent distribution of entitlements of durations. In particular, around one half of the benefits were completed before the fourth month, and 73 percent of the benefits end before eight months. Less than 6.5 percent of workers received transfers for more than one year.

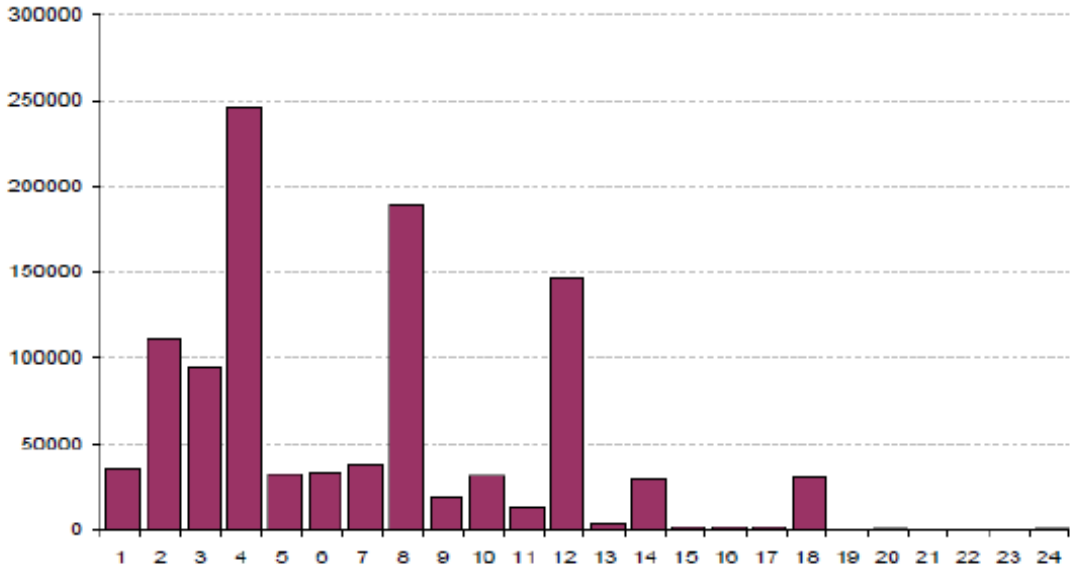
Figure 6. Basic UI Transfer



(a) Total workers (b) Construction workers

Source: Unemployment Beneficiaries Database.

Figure 7. Benefits Duration



Source: Unemployment Beneficiaries Database.

The uncompleted duration distribution by the entitlement of benefit duration is summarized in Table 12. (See also Tables 13 and 14 for permanent and construction workers, respectively.) A significant proportion of observed durations end before the entitlement period, particularly for those with longer duration.[27]

Another aspect to stress is that most of the entitlements are concentrated in months 4, 8 and 12. In this case, the number of entitlements of 12 months represent 28 percent, while those with longer duration add up to 8 percent of spells.[28]

Our strategy for evaluating the impact of the unemployment benefits on duration and other outcomes is driven by two sources of identification. The first is time variation: after March 2006, the parameters of the unemployment insurance system were modified. The second is cross-sectional variation: according to different characteristics of the workers, the eligibility and entitlement of benefits change. Figure 8 is related to the impact of these variations on duration.

In particular, we first show the impact of time variation: the number of workers by uncompleted durations are shown before and after the reform. It can be seen from this first figure that short-term benefits increased substantially after the reform. This is related to the less strict eligibility criteria applied. On the other hand, longer durations are also more frequent (after the reform, there are around 30 thousand spells that lasted more than 12 months).

We analyze the impact of cross-sectional variation by plotting the duration of benefits according to the age. In particular, those workers with more than 45 years of age are eligible for an extension of benefits for 6 additional months. We compare the survival function of these two groups of workers: those between 40 and 44 years of age and those between 46 and 50 years of age. As can clearly be seen, the latter have a longer duration in benefits.

5.2 Impact Evaluation and Estimates

In this section we will analyze more formally the impact of Unemployment Insurance on finding rate of the covered workers. We will also analyze the impact of severance payments on finding rate, using the changes in the level of SP in 2005 and 2007.

For implementing these exercises we select those UI beneficiaries whose benefits began between 2005 to 2007. We generate their labor history both before and after the UI coverage, using the SIPA and Self-Employed databases. We then construct some relevant variables for our exercises (such as number of declarations in the last 36 months, tenure in the last job, mean last

[27] This table was constructed imposing decreasing survival rates and entitlements no longer than 18 months. These assumptions were needed in order to avoid dealing with blank cells and with entitlements that seem to be longer than the longest durations allowed in the legislation. In all, error in variables seems to be frequent.

[28] It is important to clarify that these numbers refer to entitlements of UI benefit durations. The effective duration of unemployment spells will differ from them (see for example Figure 12 for a survival function using administrative data).

Table 12. Survival of UI Beneficiaries by UI Entitlement

	Entitlement to UI duration								
	2	3	4	8	10	12	14	18	Total
Total spells	47020	35329	223646	298359	43819	232137	82736	77820	1040866
% of spells	5%	3%	21%	29%	4%	22%	8%	7%	100%
UI duration									
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2	0.965	0.970	0.969	0.962	0.977	0.976	0.970	0.982	
3		0.894	0.899	0.880	0.927	0.920	0.911	0.948	
4			0.823	0.804	0.874	0.867	0.855	0.913	
5				0.716	0.618	0.803	0.795	0.873	
6				0.665	0.581	0.766	0.752	0.845	
7				0.610	0.551	0.725	0.713	0.820	
8				0.546	0.517	0.682	0.663	0.792	
9					0.481	0.645	0.501	0.763	
10					0.454	0.613	0.465	0.741	
11						0.583	0.433	0.720	
12						0.548	0.407	0.693	
13							0.349	0.503	
14							0.325	0.479	
15								0.450	
16								0.430	
17								0.409	
18								0.389	

Source: Unemployment Beneficiaries Database.

Note: UI duration by entitled UI duration. Durations are in months. Spells with inconsistent entitlement or durations were eliminated.

Table 13. Survival of UI Beneficiaries by UI Entitlement: Permanent Workers

	Entitlement to UI duration							
	2	4	8	10	12	14	18	Total
Total spells	45973	177376	230693	28249	232022	53048	77800	845161
% of spells	5%	21%	27%	3%	27%	6%	9%	100%
UI duration								
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2	0.967	0.970	0.964	0.979	0.976	0.974	0.982	
3		0.900	0.884	0.932	0.920	0.923	0.948	
4		0.824	0.809	0.880	0.867	0.871	0.913	
5			0.720	0.592	0.803	0.814	0.873	
6			0.672	0.557	0.766	0.775	0.845	
7			0.618	0.529	0.725	0.740	0.820	
8			0.554	0.495	0.682	0.691	0.792	
9				0.458	0.645	0.506	0.763	
10				0.432	0.613	0.470	0.741	
11					0.583	0.439	0.720	
12					0.548	0.415	0.693	
13						0.341	0.503	
14						0.319	0.479	
15							0.450	
16							0.430	
17							0.409	
18							0.389	

Source: Unemployment Beneficiaries Database.

Note: UI duration by entitled UI duration. Durations are in months. Spells with inconsistent entitlement or durations were eliminated.

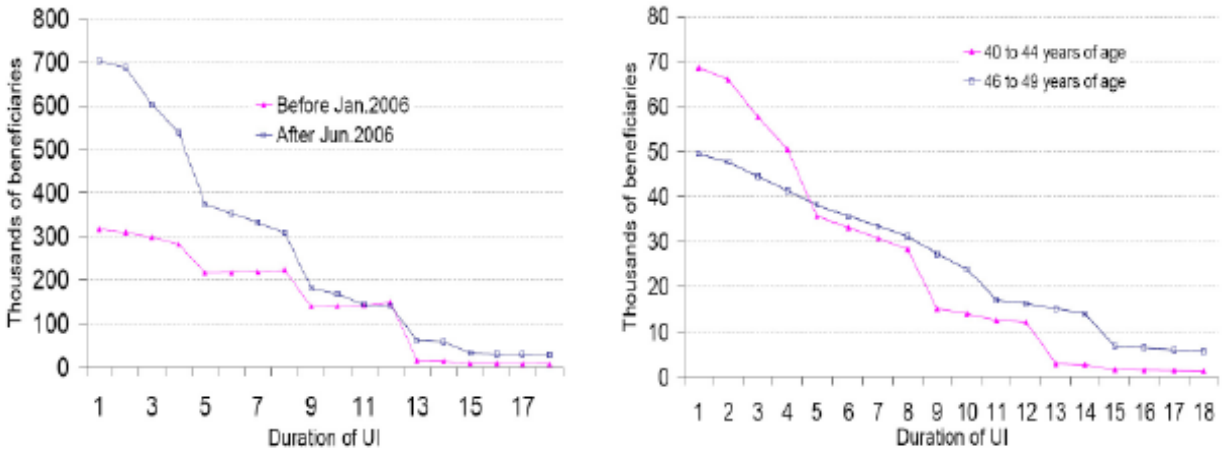
Table 14. Survival of UI Beneficiaries by UI Entitlement: Construction Workers

Entitlement of UI duration							
	3	4	8	9	10	14	Total
Total spells	32759	46039	67430	11279	15511	29665	202683
% of spells	16%	23%	33%	6%	8%	15%	100%
UI duration							
1	1.000	1.000	1.000	1.000	1.000	1.000	
2	0.971	0.967	0.956	0.975	0.972	0.963	
3	0.894	0.894	0.864	0.916	0.917	0.890	
4		0.817	0.787	0.688	0.862	0.826	
5			0.703	0.650	0.667	0.762	
6			0.645	0.611	0.624	0.710	
7			0.587	0.583	0.591	0.664	
8			0.522	0.552	0.557	0.612	
9				0.519	0.523	0.493	
10					0.494	0.456	
11						0.421	
12						0.393	
13						0.363	
14						0.336	

Source: Unemployment Beneficiaries Database.

Note: UI duration by entitled UI duration. Durations are in months. Spells with inconsistent entitlement or durations were eliminated.

Figure 8. Benefits Uncompleted Duration: Comparison between Dates and Age Groups



Note: UI duration by (a) beginning of UI spell and (b) by age for spells after June 2006. Source: Unemployment Beneficiaries database.

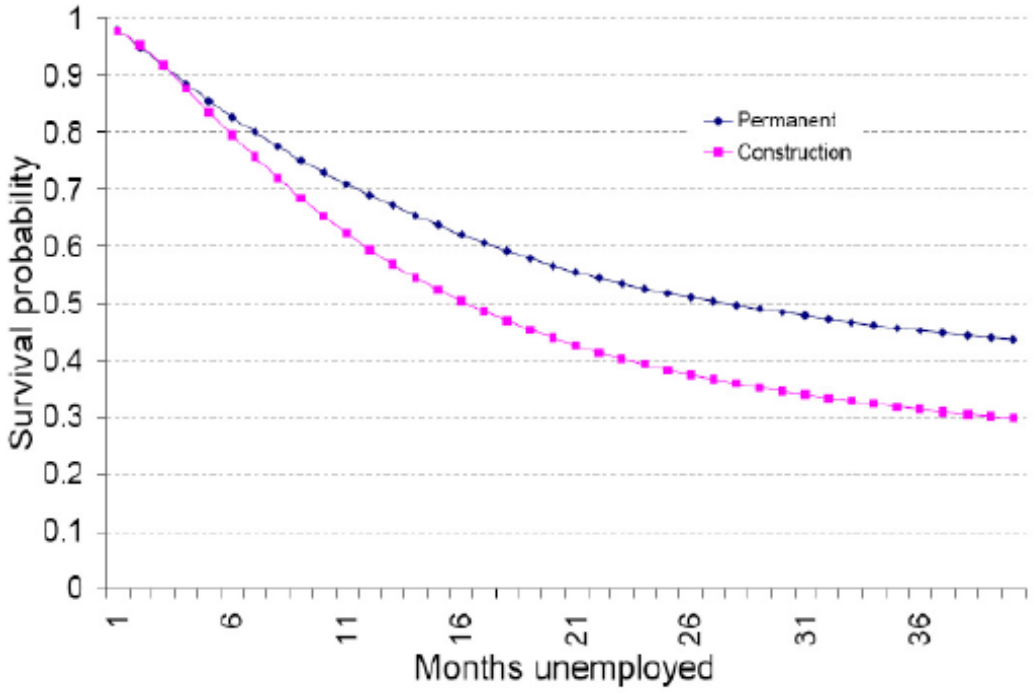
year pre-unemployment wages, etc.) and include additional variables that characterize the worker or the job (such as age, gender, location, industry, etc.). We will call this source the Administrative Unemployment Duration database (AUD), and it will be the source for implementing the impact evaluation. (See the Appendix for a complete description of these variables and the databases.)

Figure 9 shows the survival function for permanent and construction workers. The survival rate at an specific duration d is the mean probability that the unemployment spell for workers is longer than d; the survival function is the plot of this rate on duration.

Construction workers exit unemployment faster than permanent workers. For both type of workers, unemployment duration is high: the probability that the worker does not find a (declared) job within two years of unemployment is 53 percent for permanent workers and 39 percent for construction workers.

Figure 10 shows the hazard function, which is the probability that a worker finds a job at duration d, given that his unemployment spell has a duration of at least d. It is apparent that the hazard rate is lower for permanent workers at all durations. Additionally, we can see that finding rate is decreasing in duration, with the exception of some peaks, for example at 4 and 5 months of unemployment duration for construction workers and at 4, 8, 12 and 13 for permanent workers. These peaks can be related to the exhaustion (or reduction) of UI transfers, which makes workers readily accept jobs to avoid income loss.

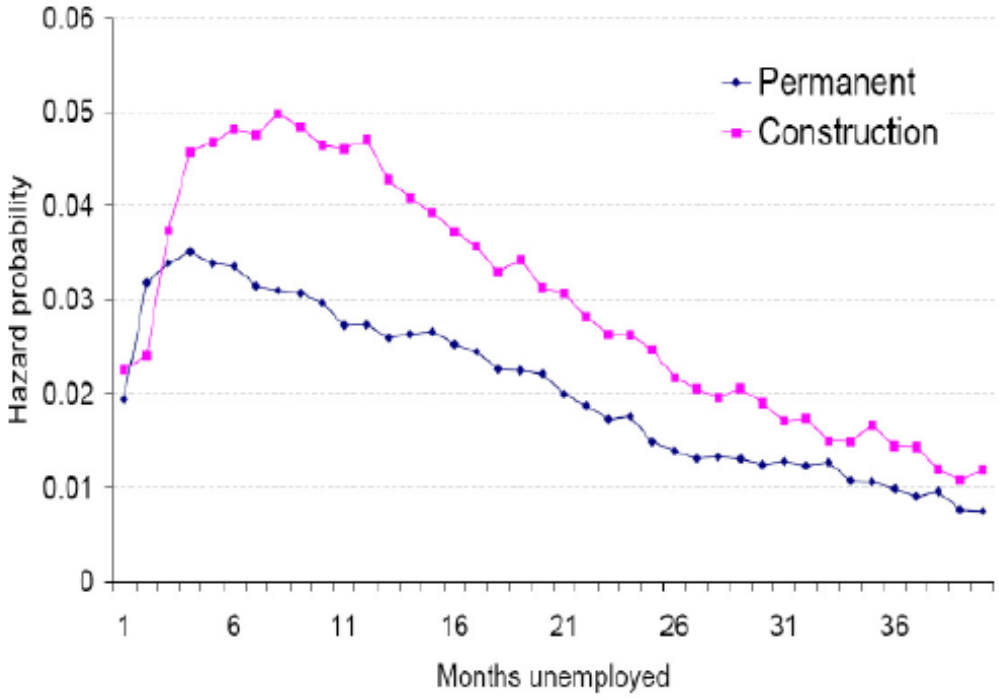
Figure 9. Survival Functions for Permanent and Construction Workers, 2005-2007



Source: Authors' calculations using administrative data described in main text and Appendix.

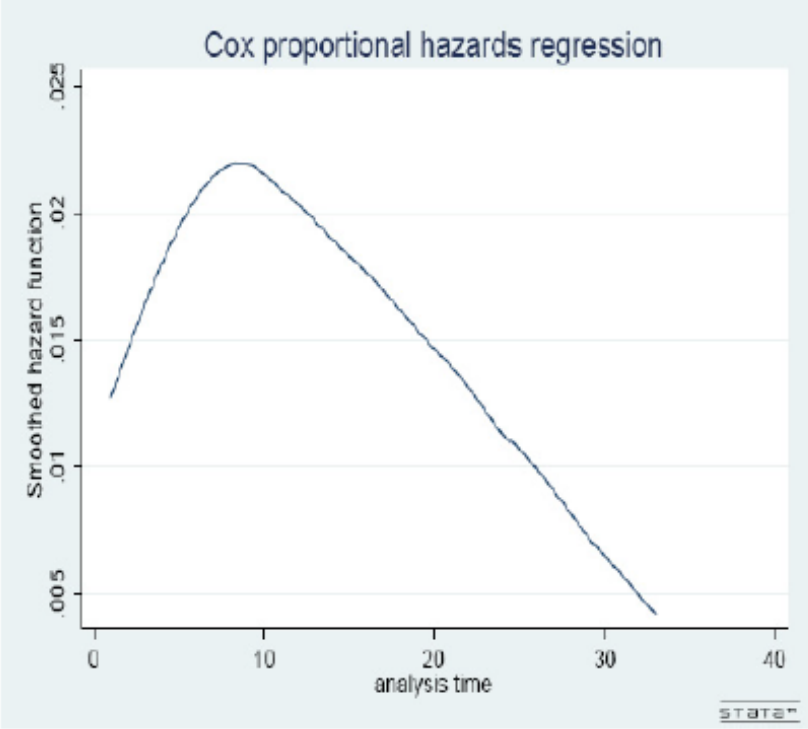
Note: Survival probability in unemployment for the two type of workers: permanent and construction workers.

Figure 10. Hazard Functions for Permanent and Construction Workers: 2005-2007



Source: Authors' calculations using administrative data described in main text and Appendix.
Note: Finding rate probability for the two type of workers: permanent and construction workers.

Figure 11. Hazard Function for Permanent Workers after Controlling for Observable Covariates



Source: Authors' calculations using administrative data described in main text and Appendix.

Note: Hazard function of the Cox duration model applied to permanent workers.

For descriptive purposes we first run a duration model (a Cox proportional hazard model), in which we observe that the level of the UI transfer and the UI duration negatively affect the finding rate, even when we control for many observable characteristics of workers. (See Table 15.) Additionally, models of this type non-parametrically estimate the hazard by duration. We present this estimation in Figure 11. We find that the finding rate is increasing in duration for the first 10 months, declining afterwards.

We will now turn to implementing different estimation strategies for evaluating the impact of UI and SP. In particular, we will focus on UI duration (making use of the discontinuity in duration entitlement at 45 years of age and at different numbers of past contributions), on UI level of transfers (focusing on the change in the maximum and minimum level of transfers in March 2006), and on SP level (focusing on the change in these transfers for some workers in November 2005 and September 2007).

Table 15. Cox Duration Model

	Permanent workers		Construction		Permanent workers Young		Permanent workers Old	
Total UI transfer	-0.2384	***	-0.4556	***	-0.3844	***	-0.3906	***
	(0.0149)		(0.0274)		(0.0238)		(0.0539)	
UI duration ent.	-0.0348	***	0.0663	***	-0.0291	***	-0.0654	***
	(0.0014)		(0.0036)		(0.0035)		(0.0075)	
I(age≥45)	0.1655	***	0.0667	**				
	(0.0217)		(0.0302)					
age	0.0004		0.0003		-0.0249	**	0.2933	***
	(0.0034)		(0.0049)		(0.0105)		(0.0541)	
age squared	-0.0005	***	-0.0002	***	-0.0001		-0.0033	***
	(0)		(0.0001)		(0.0002)		(0.0005)	
gender	-0.5816	***	-0.8017	***	-0.5758	***	-0.6091	***
	(0.0102)		(0.177)		(0.0154)		(0.0388)	
spouse	0.0441	***	0.139	***	-0.0333	**	0.0330	
	(0.0094)		(0.0172)		(0.0139)		(0.031)	
children	0.0928	***	0.0744	***	0.1183	***	0.1490	***
	(0.0043)		(0.0058)		(0.0061)		(0.0155)	
log of p.u.wage	0.3434	***	0.0841	***	0.3713	***	0.2595	***
	(0.0085)		(0.0152)		(0.0187)		(0.0384)	
log of imputed SP					0.0724	***	0.1245	***
					(0.0152)		(0.0308)	
past contributions					0.0119	***	0.0077	***
					(0.0011)		(0.0023)	
tenure					-0.0153	***	-0.0135	***
					(0.001)		(0.0020)	
tenure squared					0.0001	***	0.0000	***
					(0.0000)		(0.0000)	
Observations	288914		73949		95052		25592	

Source: AUD, see main text and Appendix.

Note: Coefficients are the result of estimating a Cox PH model of unemployment duration on the UI transfer, UI duration of each spell and controls. Numbers in parentheses are standard deviations of the coefficients. Models by age are constrained to workers with more than one year of contributions before unemployment spell. Statistical significance: * significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level. AUD, see main text and Appendix.

5.3 Extension of UI Duration for Older Workers

As explained in Section 2, workers older than 45 receive an extra six months of benefits. Thus, our first exercise consists of analyzing the impact of an extension of UI duration using this discontinuity in the duration entitlement.

This distinction between older and younger workers is automatically applied by the agency, and there is no evidence that this discontinuity affects layoffs. That is to say, there is no reason to think that there is a difference between laid-off in the groups younger and older than 45.

The difference in mean UI duration between the two groups is substantial. Nevertheless, the increase for an important proportion of workers implies going from 12 months to 18 months. In other words, when the UI duration is already long, the incidence of an extension is probably less important. This is a caveat, and it would lead us to provide specific estimates for a subsample of unemployed workers, those with fefwer than 17 contributions: for younger workers, this would imply 4 months of UI while for those older than 45 years of age it would be extended to 10 months.

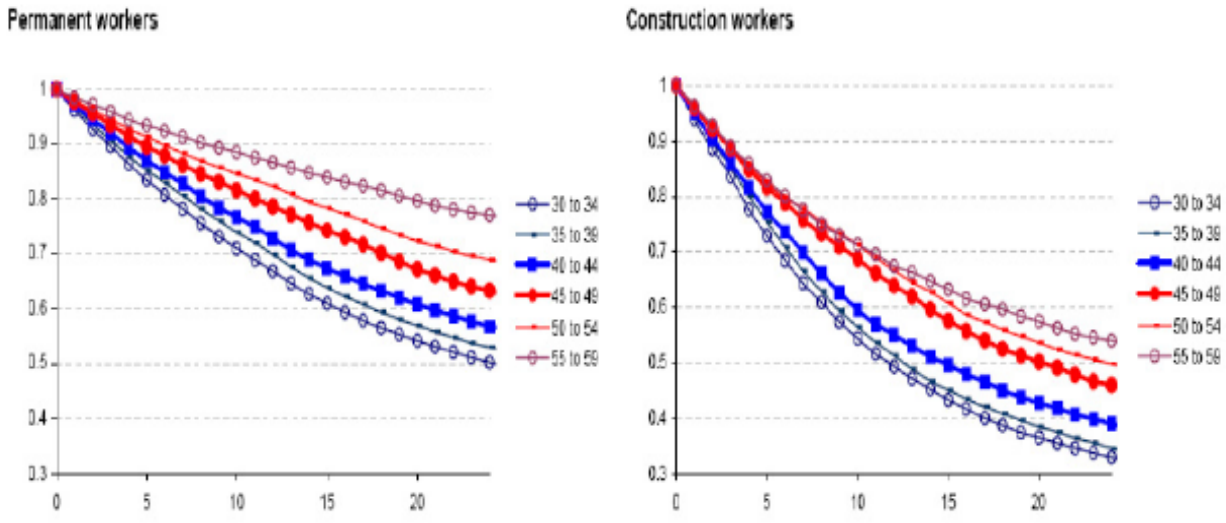
We use our dataset to analyze the effect of this discontinuity.

The assumption behind the analysis is that workers of 44 years of age are not substantially different from those between 45 and 49 years old. In any case, we assume that any effect of age on finding rate would be continuous and that it can be controlled by a linear or quadratic function of age. The discontinuous effect at age 45 would capture the extension in UI duration.

Figure 12 shows the survival functions for permanent and construction workers by age groups. There is an observable difference between workers by age groups at all durations. Younger workers have lower survival rates (exit unemployment sooner) than older workers. This is a rather monotonic effect and can be observed for all durations. The difference between workers of 40 to 44 years of age and workers between 45 to 49 years of age is also apparent, but it is difficult to assess whether this difference is particularly discontinuous.

To observe some discontinuity we focus on Figure 13, which shows survival probability at different durations by age groups for both permanent and construction workers. For example, about 70 percent of permanent workers younger than 20 years of age are still in unemployment after 6 months of the beginning of the spell, while more than 90 percent of those older than 50 years of age suffer at least the same duration of unemployment. From this figurewe can observe the discontinuity occurring at age 45. This discontinuity is difficult to observe in the case of permanent workers, but is clear in the case of construction workers. For this group of workers, the effect is not only observable but also very relevant in economic terms. In particular, survival probability at one year (12 months of duration) goes from 55 percent for workers between 40 and 44 years of age to 64 percent for workers between 45 and 49 years of age.

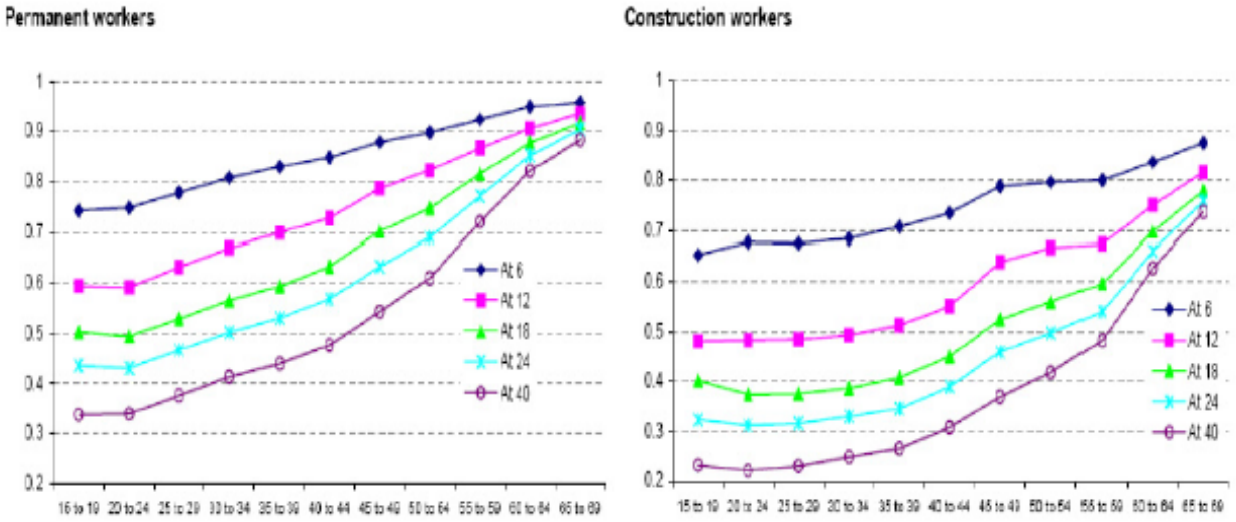
Figure 12. Impact of UI Duration, Age Effect: Survival Function by Age Groups, 2005-2007



Source: AUD, see main text and Appendix.

Note: Survival probability in unemployment by age groups.

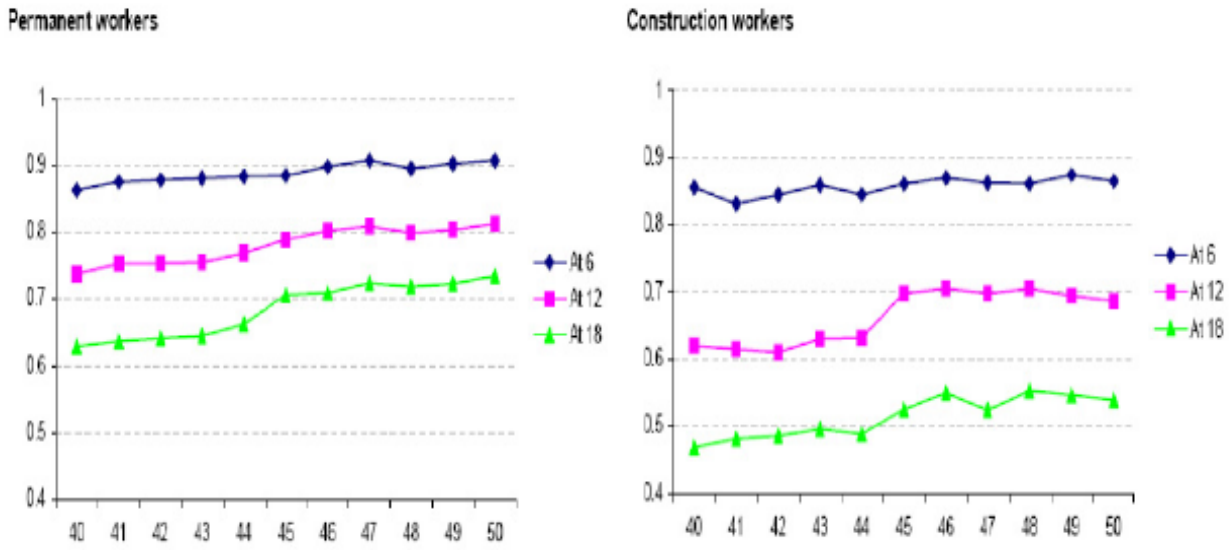
Figure 13. Impact of UI Duration, Age Effect: Survival Probability at Particular Durations by Age Groups, 2005-2007



Source: AUD, see main text and Appendix.

Note: Survival probability in unemployment by age groups. Each line is the probability that the worker is still unemployed after a given number of months by age groups.

Figure 14. Impact of UI Duration, Age Effect: Survival Probability at Particular Durations by Age, 40-50 Years



Source: AUD, see main text and Appendix.

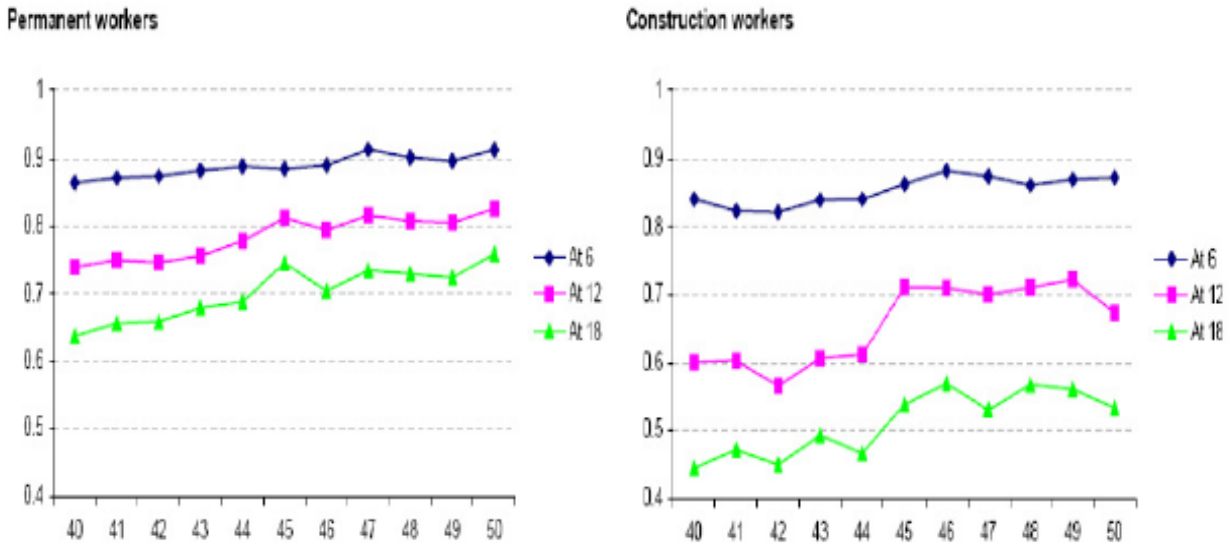
Note: Survival probability in unemployment by years of age at the beginning of the spell. Each line is the probability that the worker is still unemployed after a given number of months by age.

Figure 14 shows the same exercise but focusing on workers between 40 and 50 years of age. Again, for construction workers the difference seems to be substantial and large (in particular at one year of duration), while for permanent workers the differences seem to be less clear and, in any case, less important: the survival probability at 12 months for workers of 44 years of age is 77 percent, while for 45 years of age it is 79 percent.

Part of the low impact of the UI extension for older workers could be related to the fact that a substantial proportion of these workers would have long UI benefits (one year) even without the extension. For that reason, we restricted our sample to those with fewer than 17 contributions in the last three years prior to UI (those with shorter UI durations). Figure 15 shows the survival probability at different durations. In this case, there seems to be some observable and discontinuous effect of age at 45 years for permanent workers. In any case, the change between 44 to 45 years of age is much higher for construction workers than for permanent ones. For the latter, survival probability at 12 months is 78 percent for workers 44 years of age and 81 percent for workers 45 years of age.

To provide concrete estimates we run a Cox duration model. In particular, we use the indicator variable $I(Age \geq 45)$, which is 1 if age at the beginning of the spell is higher than

Figure 15. Impact of UI Duration, Age Effect: Survival Probability at Particular Durations by Age, 40-50 Years, Fewer than 17 Contributions



Source: AUD, see main text and Appendix.

Note: Survival probability in unemployment by years of age at the beginning of the spell. Each line is the probability that the worker is still unemployed after a given number of months by age. The sample is restricted to those with few contributions (short UI duration).

or equal to 45 and zero otherwise.[29] We control for a quadratic function of age to estimate any continuous effect of age on duration. We also control for number of children, gender of the worker, presence of spouse and the log of previous unemployment wage. We also include contributions, tenure, tenure square, and fixed effects for year, region and industry. The coefficient associated to the indicator variable would estimate the impact of UI extension at age 45. Then, we will estimate the following model:

$$\theta(t_u|x) = \lambda(t_u)\exp(\gamma_1 I(Age \geq 45) + x\beta) \tag{2}$$

where the x's include the control variables and γ_1 measures the impact of the UI benefit extension at age 45. We also restrict the sample to those workers between 35 to 55 years.

The results are shown in Table 16. We observe that the finding rate is reduced more than 30 percent by the extension of UI benefits for older workers. This effect is significant for both permanent and construction workers, while for the latter the effect reaches 40 percent.

[29]We restrict the sample to those spells that began after June 2006, because from this month on the extension of UI benefits is applied to all workers older than 45 years of age (before this date, it was restricted to those attending school, or children less than six years old, or children with a disability).

We then restrict the sample to those workers with fewer than 17 contributions, trying to analyze the effects for those workers for which the extension is more relevant. The results are even stronger: the finding rate declines 46 percent for permanent workers and 50 percent for construction workers.

Finally, the results allow us to conclude that UI extension due to age extends unemployment duration significantly reduces the finding rate. We found that this impact is stronger and more significant for construction workers than for permanent workers. This could be related to the lower duration of UI benefits for construction workers, which makes them more responsive to an extension, and also to the fact that the UI is more relevant in terms of benefits, given the lower wages that construction workers receive.

5.4 Extension of UI Duration for Longer Contributions

UI duration depends on work history, in particular on the number of months in which the worker has been declared as working in a private firm as a wage earner (number of contributions). This dependence is not proportional: permanent young workers with 11 months of contributions are eligible for 2 months of UI, while those workers with 12 months are eligible for 4 months. The same occurs for workers of 23 to 24 months of contributions, which are eligible for 4 or 8 months of UI benefits, respectively. The same occurs for workers older than 45 years of age, for which duration is extended six additional months. In this exercise we will exploit this discontinuity in duration.

The main assumption for implementing this estimation is that any effect of contributions over unemployment duration is continuous and can be captured by a linear or quadratic function, and that any change in unemployment duration between those with 11 and 12 months of declarations is due to UI duration.

The first exercise is to estimate the effect of each UI duration on the finding rate of workers of a particular number of past contributions. We concentrate on permanent workers, for which the number of UI months changes with 24 contributions (from 4 to 8 months of UI for workers younger than 45 years of age and from 10 to 14).

Then we run Cox duration models on identification variables that specify the length of UI benefits (number of months of UI transfers). The controls are the same as in the previous estimation. Thus, any change in UI duration is related to the discontinuity at a particular number of contributions and will be considered the effect of UI duration.

The model is:

$$\theta(t_u|x) = \lambda(t_u)\exp(\gamma I(\text{UI duration} = 8) + x\beta) \tag{3}$$

Table 16. Impact of UI Duration, Age Effect: Cox Duration Model Results, Workers 35-55 Years of Age

	Workers between 35 to 55 years of age						Fewer than 17 contributions					
	Total		Permanent		Construction		Total		Permanent		Construction	
I($age \geq 45$)	-0.3389	***	-0.3039	***	-0.4143	***	-0.4643	***	-0.4628	***	-0.5048	***
	(0.0286)		(0.0354)		(0.0492)		(0.0455)		(0.0720)		(0.0595)	
age	0.0003		0.0087		0.0094		0.0174	***	0.0263	***	0.0178	**
	(0.0197)		(0.0245)		(0.0337)		(0.0059)		(0.0091)		(0.0084)	
age square	-0.0002		-0.0004		-0.0002		-0.0004	***	-0.0006	***	-0.0004	***
	(0.0002)		(0.0003)		(0.0004)		(0.0001)		(0.0001)		(0.0001)	
gender	0.2846	***	0.2985	***	0.5644	*	0.1245	***	0.1660	***	0.4627	*
	(0.0211)		(0.0218)		(0.2894)		(0.0229)		(0.0236)		(0.2510)	
spouse	0.0161		-0.0166		0.0928	***	0.0286		0.0082		0.0764	***
	(0.0163)		(0.0196)		(0.0298)		(0.0180)		(0.0242)		(0.0277)	
children	0.0411	***	0.0510	***	0.0253	***	0.0404	***	0.0412	***	0.0380	***
	(0.0043)		(0.0059)		(0.0063)		(0.0064)		(0.0107)		(0.0081)	
log of p.u.wage	0.2542	***	0.2549	***	0.2929	***	0.2930	***	0.3063	***	0.3427	***
	(0.0223)		(0.0273)		(0.0394)		(0.0257)		(0.0339)		(0.0411)	
log of imputed SP	0.0445	**	0.0553	**	0.0171		-0.0454	*	-0.0829	***	-0.0314	
	(0.0196)		(0.0231)		(0.0395)		(0.0242)		(0.0305)		(0.0422)	
past contributions	-0.0109	***	-0.0152	***	0.0023		-0.0043		-0.0086	**	0.0086	*
	(0.0010)		(0.0012)		(0.0016)		(0.0028)		(0.0036)		(0.0047)	
tenure	-0.0106	***	-0.0133	***	-0.0075	***	-0.0048	**	-0.0042		-0.0035	
	(0.0012)		(0.0014)		(0.0024)		(0.0021)		(0.0030)		(0.0030)	
tenure squared	0.0000	***	0.0001	***	0.0001	***	0.0000	***	0.0000		0.0000	**
	(0.0000)		(0.0000)		(0.0000)		(0.0000)		(0.0000)		(0.0000)	
Observations	36527		26100		10389		25730		15313		10362	

Source: AUD, see main text and Appendix.

Note: Coefficients are the result of estimating a Cox PH model of unemployment duration on the indicator variable that identifies workers older than 45 years of age and controls. Fixed effects by region, year and industry. Sample is restricted to workers between 35 and 55 years of age, whose displacement was after August 2006. Numbers in parentheses are standard deviations of the coefficients. Statistical significance: * significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level.

where the x's include the control variables and γ measures the effect of extended UI duration on the finding rate. We estimate the effect of the extension of UI from 4 to 8 months using workers with between 19 and 28 contributions. We split the sample between workers younger and older than 45 years of age.

The first column of Table 17 shows the results for the subsample of workers that had accumulated between 19 and 28 contributions in the 36 months previous to layoff, and with less than 45 years of age. Those with less than 24 contributions would be eligible for 4 months of UI and those with 24 contributions or more would be eligible for 8 months of contributions. We find that those with longer UI duration reduce their finding rate by almost 50 percent. When we analyze the effect for older workers, for which UI is extended from 10 to 14 months, the reduction in finding rate is greater: more than 60 percent. Thus, older workers seem to be more responsive to UI extensions.

On the whole, we have found significant and important effects of UI entitlement durations on the duration of of unemployment spells.

5.5 Increase in UI Transfers after March 2006

We now turn to the estimation of the effect of the level of benefits on unemployment duration. To do so we exploit the UI reform in 2006.

As explained in Section 2, UI transfers increased in March 2006. This change was significant: mean and median transfers increased 30 percent, while mean private formal wages rose 3 percent between January and July of 2006.

Additionally, no changes in separation or macroeconomic conditions occurred during this period. In this sense, the change in UI can be seen as exogenous: it was not based in recent economic development but on the fact that UI amounts had not been updated since the 1990s.

Figure 16 shows the evolution of maximum benefits over mean private wages over time. The change in April 2006 implies a much higher UI transfer. Given the rising trend in wages, the potential impact of this higher maximum benefits is then reduced and have a potential impact only limited in time. For this reason, we will concentrate our analysis around the change: we will consider displacements between July 2005 and December 2006.

This change affected all workers, even those who were already receiving transfers. Nonetheless, the increase would be more relevant for some subgroup of workers: those for whom the UI maximum level is binding, and those who are receiving the first four transfers (before the transfer declines with duration).

Additionally, given that the change only affects workers with low UI duration, we will try to focus on changes in finding rate in short durations of unemployment by censoring the durations to 8 months.

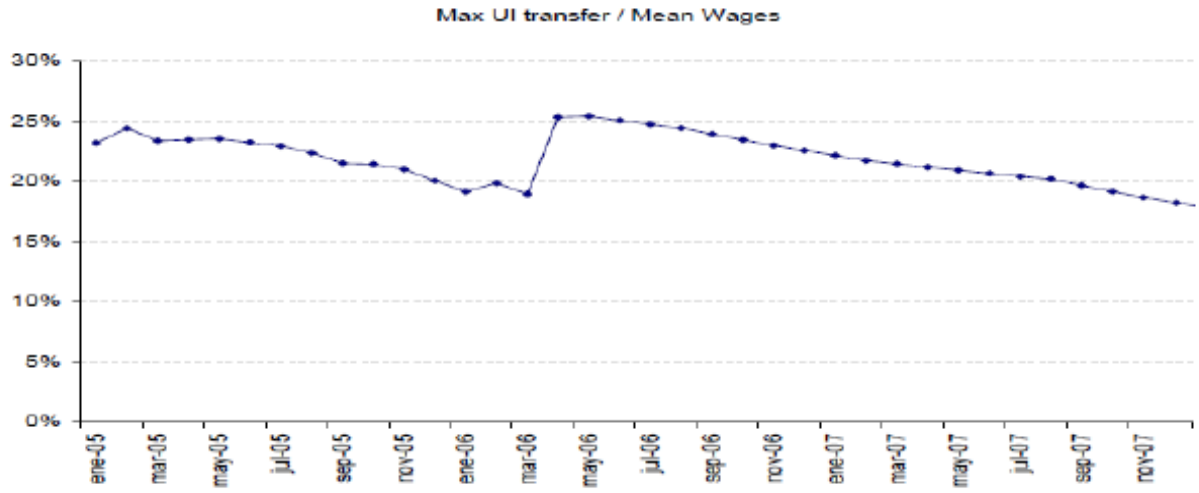
Table 17. Cox Duration Model: Past Contributions

	Permanent workers				Construction workers			
	Age<45		Age≥45		Age<45		Age≥45	
I(UI dur = 8)	-0.4909	***	-0.6238	***	-0.4293	***	-0.3668	***
	(0.0373)		(0.1094)		(0.0416)		(0.0806)	**
age	-0.065	***	0.2081	*	-0.1437		-0.3208	
	(0.018)		(0.123)		(0.0906)		(0.1493)	
age square	0.0007	**	-0.0022	*	-0.0113		-0.0726	
	(0.0003)		(0.0011)		(0.1014)		(0.1772)	
gender	0.2871	***	0.2148	**	0.1001		0.0497	
	(0.0265)		(0.0969)		(0.0974)		(0.1679)	
spouse	-0.0241		0.1207		-0.0387		-0.178	
	(0.0261)		(0.0785)		(0.1092)		(0.1855)	
children	0.0564	***	0.1233	***	-0.1132		-0.0951	
	(0.011)		(0.0306)		(0.0941)		(0.1591)	
log of p.u.wage	0.3385	***	0.4773	***	-0.1235		0.0256	
	(0.0355)		(0.1272)		(0.0914)		(0.1532)	
log of imputed SP	0.1184	***	0.0187		-0.3983	***	-0.5375	***
	(0.0336)		(0.1111)		(0.0976)		(0.1696)	
past contributions	-0.009		-0.1446		-0.1419		-0.2111	
	(0.0743)		(0.2308)		(0.0944)		(0.1584)	
past contributions sq.	0.0011		0.0044		-0.1514		-0.071	
	(0.0016)		(0.005)		(0.1007)		(0.1664)	
tenure	0.005		-0.0138		-0.0705		0.0485	
	(0.0102)		(0.03)		(0.1104)		(0.1939)	
tenure square	-0.001	***	-0.0004		4.4257	***	-0.6692	***
	(0.0003)		(0.0009)		(0.1129)		(0.1506)	
Fixed effects	yes		yes		yes		yes	
Observations	12631		1859		7552		2708	

Source: AUD, see main text and Appendix.

Note: Coefficients are the result of estimating a Cox PH model of unemployment duration on the number of months of UI duration and controls that include a quadratic in past contributions. The discontinuity in the UI duration on the number of past contributions is exploited. Numbers in parentheses are standard deviations of the coefficients. Statistical significance: * significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level.

Figure 16. Maximum benefits over mean private wages



Source: AUD, see main text and Appendix.

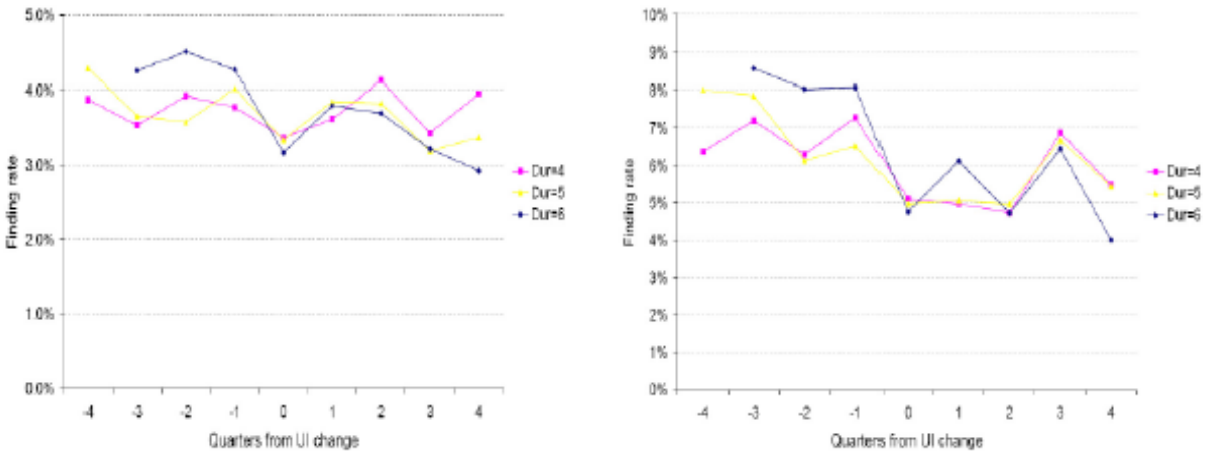
Nevertheless, other contemporaneous changes in UI are affecting the sample of beneficiaries of UI. In particular, from March 2006 workers between 6 and 11 contributions in the last three years are eligible for receiving transfers (two months in the case of workers younger than 45 years of age and 8 months for the older). This change is important and increased the number of UI recipients.

In our exercise we will be considering the subsample of those workers with more than a year of past contributions to prevent that any change in the characteristics of UI recipients from affecting the analysis.

We will first show some statistics, and then go to duration models to measure this effect. Figure 17 shows the mean finding rate (the proportion of workers that begin a declared job) by duration through time. Quarter 0 is the one in which the change occurs (the second quarter of 2006). We observe that, for low durations, the finding rate falls at the time of the change. Similar behavior is observed for permanent and construction workers.

Figure 18 shows the survival functions, comparing UI spells that begin before and after the change. More concretely, we restrict the sample to those unemployment spells that begin in a separation between April and June 2005, before the change, and unemployment spells that begin between April and June 2006, after the change. The left panel shows only permanent workers. For these workers the differences are apparent after eight periods of duration: for the sample before the change, 77 percent of workers did not find a job in the first 6 months of unemployment; for the sample after the change, 80 percent of workers were still unemployed after eight periods of

Figure 17. Impact of UI Transfer Level, Change in March 2006: Mean Finding Rate by Duration by Quarters



(a) Permanent workers (b) Construction workers

Source: AUD, see main text and Appendix.

Note: Probability that the worker finds a job at different duration in thime. Quarter=0 is the second quarter of 2006, the quarter in which the parameters of UI transfer level are increased.

duration. Differences amplify for longer durations. In the case of construction workers, differences are even more relevant: the survival rate after six periods of unemployment duration was 63 percent and 75 percent for the sample before and after the change, respectively.

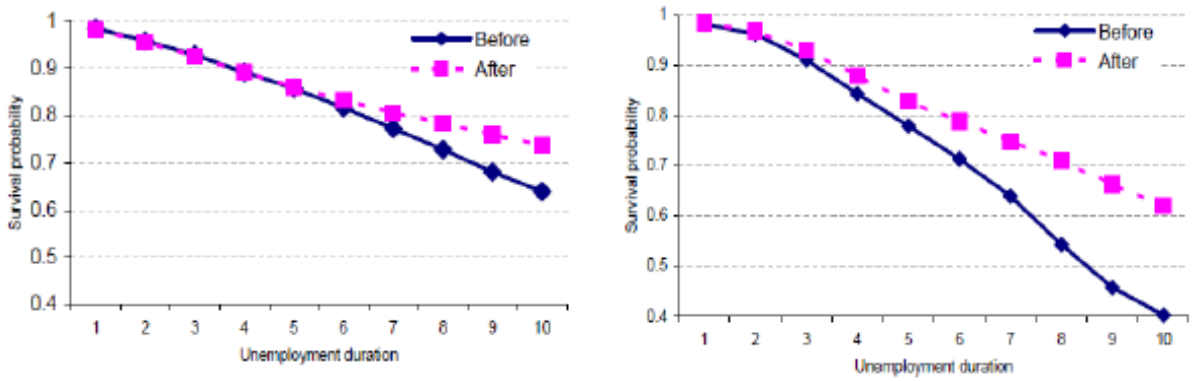
We now turn to the impact estimates, using a Cox duration model. The first estimation identifies the impact of the UI transfer increase using just an identification variable which is one for period after April 2006, and zero otherwise. The model is:

$$\theta(t_u|x) = \lambda(t_u)\exp(\gamma_1 I(t \geq \text{March } 2006) + x\beta) \tag{4}$$

where the x's include the control variables (as in previous exercises) and γ_1 measures the effect of the UI reform of March 2006 over the finding rate.

Using this specification, we find that the increase in benefits reduced finding rate. Finding rate decreases both for permanent workers and for construction workers, and young and old workers. The effect goes from 23 percent for young permanent workers to 58 percent for old construction workers. In fact, for both type of workers, the effect for older workers is higher. (See Table 18.)

Figure 18. Impact of UI Transfer Level, Change in March 2006: Survival Probability before and after the Change



(a) Permanent workers (b) Construction workers

Source: AUD, see main text and Appendix.

Note: Survival probability in unemployment before and after the change in UI level of transfers. Sample before change comprises all separations between Apr.2005 and Jun.2005; sample after change comprises all separations between Apr.2006 and Jun.2006.

We also added aggregate variables, such as a trend, an index of demand for workers in Greater Buenos Aires, an index of vacancies for the Greater Buenos Aires (from Ministry of Labor) and the level of unemployment, the results are negative and significant, but the effect turns out to be lower for the young group: it is reduced to 7 percent in the case of young permanent workers and to 36 percent in the case of young construction workers.[30]

When we impose censoring at 8 months, the estimates of the effect of higher benefits on durations do not change and they are practially invariant in the four cases we analyze.

In a second exercise, the impact of an increase in UI transfers is analyzed through the log of the index of maximum UI transfer on an index of formal private wages (see Figure 16). This variable is a proxy for the aggregate replacement rate. It is important to note that this variable is common to all workers, as an aggregate effect. Table 19 shows the results for these estimates. We also include in these estimations additional controls that are related to aggregate conditions (trend, labor demand index, vacancy rates, unemployment rates, as explained above). Permanent workers show an elasticity of finding rate with respect to the level of UI of -0.66 (young workers) and -1.56 (older workers). If UI transfers were to increase by 10 percent, the finding rate would reduce 6.6

[30]Note that the sample for this estimation is different than the sample for the previous figure. In the case where we imposed the same sample, the outcome is qualitatively similar, but differences between young and old workers are even greater, both for permanent and for construction workers.

Table 18. Impact of UI Transfer Level, UI Change: Cox Duration Model Results

	Permanent workers				Construction workers			
	Age<45		Age≥45		Age<45		Age≥45	
I(period≥200603)	-0.2282	***	-0.4121	***	-0.5185	***	-0.5787	***
	(0.0332)		(0.0873)		(0.0661)		(0.1120)	
age	0.0166	*	0.1265	**	0.0012		0.0987	*
	(0.0090)		(0.0512)		(0.0170)		(0.0553)	
age square	-0.0006	***	-0.0015	***	-0.0001		-0.0011	**
	(0.0001)		(0.0005)		(0.0003)		(0.0005)	
gender	0.2572	***	0.3278	***	0.1250		0.7753	
	(0.0131)		(0.0373)		(0.1935)		(0.5018)	
spouse	0.0177		0.0104		0.0295		0.0349	
	(0.0128)		(0.0306)		(0.0248)		(0.0400)	
children	0.0248	***	0.0685	***	0.0330	***	0.0609	***
	(0.0049)		(0.0124)		(0.0066)		(0.0105)	
p.u.wage	0.3387	***	0.2810	***	0.3201	***	0.3037	***
	(0.0178)		(0.0441)		(0.0395)		(0.0486)	
Observations	47041		11880		10708		4987	

Source: AUD, see main text and Appendix.

Note: Coefficients are the result of estimating a Cox PH model of unemployment duration on the indicator variable that identifies those periods after UI transfer level change and controls, including fixed effects (see main text). Sample is restricted to workers who were displaced between July 2005 and December 2006 and who had at least 12 months of contributions. Numbers in parentheses are standard deviations of the coefficients. Statistical significance: * significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level.

percent and 15.6 percent for young and older workers, respectively. These figures are in line with the pevious estimation.

On the other hand, the same exercise does not show any negative impact on construction workers. This is probably related to the fact that this proxy could be less relevant given that mean and median UI transfers for these workers are lower than the maximum level.

Overall, the results show that the increase in UI transfer levels imply a significant reduction in finding rate. The range of estimates in this case is wide, but the more complete model imply an elasticity of around -0.7 for an increase in the parameters of UI transfers for permanent workers. Again, an increase of 10 percent in the UI level would imply a 7 percent reduction in finding rate.

5.6 Reduction in SP Transfers

Up to now we have evaluated two parameters of UI: the level of transfer and its duration. The following analysis is related to the impact of severance pay level on unemployment duration. The reason for this analysis is twofold. First, severance pay is another source of protection for the unemployed: workers are compensated for income loss due to displacement with severance pay, and job search can be financed through this source. Second, severance pay can be seen as a particular initial transfer of UI, unconditioned on UI duration and success in job finding. In this last sense, we can measure to what extent unemployment and search behavior can be affected by these kinds of transfers.

As described in Section 2, SP suffered many changes after 2002: it was doubled for workers who began their jobs before February 2002, under the condition that this temporary increase would end when unemployment reached 10 percent. Severance pay was reduced in 2005, but unemployment was under 10 percent only in 2007, which motivated a reduction in severance pay in September 2007.

Then, jobs created after February 2002 had only ordinary levels of severance, while severance pay was reduced to the ordinary level (from 1.5 times ordinary level) for jobs created before February 2002.

This discontinuity allows us to perform a kind of difference-in-difference analysis. The assumption is that workers who began their jobs before or after February 2002 are not essentially different. Additionally, we assume that any effect of tenure on duration is continuous, so we can control for this by a particular function (quadratic) of tenure.

To make the exercise more precise we will also present results for a subsample of workers: those who began their jobs around February 2002 and who were displaced in 2007.

For concreteness, we will estimate the following model:

$$\theta(t_u|x) = \lambda(t_u)\exp(\gamma_1 I(t_s \geq \text{Sep2007}) + \gamma_2 I(t_i \leq \text{Feb2002}) + \gamma_1 I(t_s \geq \text{Sep2007}) * I(t_i \leq \text{Feb2002}) + x\beta) \quad (5)$$

Table 19. Impact of UI Transfer Level, UI Transfer Level Indicator: Cox Duration Model Results, Permanent Workers

	Younger than 45		Older than 45	
ln $indiceUI$	-0.6676	***	-1.5610	***
	(0.1142)		(0.2851)	
age	-0.0048		0.1721	***
	(0.0083)		(0.0478)	
age squared	-0.0003	**	-0.0020	***
	(0.0001)		(0.0004)	
gender	0.2254	***	0.3262	***
	(0.0119)		(0.0319)	
spouse	0.0079		0.0129	
	(0.0118)		(0.0278)	
children	0.0234	***	0.0644	***
	(0.0045)		(0.0116)	
log of p.u.wage	0.3492	***	0.2420	***
	(0.0157)		(0.0366)	
log of imputed SP	0.0924	***	0.0704	**
	(0.0132)		(0.0298)	
past contributions	-0.0059	***	-0.0070	***
	(0.0008)		(0.0018)	
tenure	-0.0168	***	-0.0145	***
	(0.0009)		(0.0019)	
tenure squared	0.0001	***	0.0001	***
	(0.0000)		(0.0000)	
t	0.0974	***	0.1338	***
	(0.0059)		(0.0147)	
t squared	-0.0036	***	-0.0030	***
	(0.0001)		(0.0002)	
creation	0.1461	***	0.1110	***
	(0.0142)		(0.0346)	
ldi	-0.0074	***	0.0112	***
	(0.0009)		(0.0022)	
vacancies	-0.0040		-0.0071	
	(0.0031)		(0.0080)	
unemployment rate	-0.0557	***	0.0620	**
	(0.0120)		(0.0308)	
Observations	55868		14574	

Source: AUD, see main text and Appendix.

Note: Coefficients are the result of estimating a Cox PH model of unemployment duration on the log of max UI transfer over mean private wages. Sample is restricted to workers who were displaced between July 2005 and December 2006 and who had at least 12 months of contributions. In this model we include variables that change over time to control for changes in aggregate conditions (time trend, time squared, job creation rate, labor demand index, index of vacancies and unemployment rate). Numbers in parentheses are standard deviations of the coefficients. Statistical significance: * significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level.

where t_s is the period of the separation, t_i is the period in which the job initiated and the $I()$ are identification functions. The control variables x are the same as in previous estimations. In this sense, we are using the difference-in-difference approach to estimate the impact of severance payments on unemployment duration.

Table 20 presents the results of the estimation of a Cox duration model in which we apply this methodology. From this source we observe that there is a positive impact of the reduction in severance pay for both permanent and construction workers. Nevertheless, these results change when we add controls or restrict the sample. In particular, when using aggregate variables as controls, effects are negative or not significant.[31]

We conducted a similar exercise for the change in severance pay in November 2005 (a reduction of 17 percent in severance for workers who began their jobs before February 2002), and in this case as well we did not observe any impact of this reduction.

6 Impact Evaluation Using Household Survey Data

6.1 Household Survey Data Duration Analysis

We constructed, using the household survey (EPH), a pooled panel sample of unemployed workers over time. The sampling design of the EPH is a rotating panel. We observe some households for two consecutive quarters, then they leave the sample and return after one year to be observed in the same two quarters as before. For example, if we observe some households in the third and fourth quarters of 2003, we will also observe them in the third and fourth quarters in 2004. We use all overlapping four period panels between the third quarter of 2003 and the third quarter of 2008. This means that the households in the last panel of our sample are observed until the fourth quarter of 2009.

In particular, we considered all unemployed workers who came from formal jobs, because they are entitled to benefits, have been unemployed for less than five months the first time they are observed and had a tenure in their last job of two years or less. Restricting our sample to those workers with less than five months of unemployment has two objectives. The first is reducing the potential sampling bias that could occur when taking a sample of unemployed workers instead of a random sample of workers flowing into the initial state of unemployment. The second goal is to capture workers receiving UI benefits instead of observing unemployed workers who could have received the UI benefit a long time ago, and that could be the reason we observe for them a longer duration in unemployment. Restricting the tenure in the last job has the objective of increasing the similarity between unemployed workers receiving and not receiving UI benefits.

[31] A negative coefficient would imply that reducing severance pay lowers unemployment exit rate and extends unemployment duration.

Table 20. Impact of SP Level, Changes in SP: Cox Duration Model Results

	Basic model				Aggregate controls			
	Permanent		Construction		Permanent		Construction	
I(layoff period≥Sep 2007)*I(entry<Feb 2002)	0.5161	***	1.6094	***	-0.0771	***	0.0997	
	(0.0284)		(0.0618)		(0.0295)		(0.0631)	
I(entry<Feb 2002)	-0.1373	***	0.1746	***	-0.1189	***	0.2256	***
	(0.0072)		(0.0154)		(0.0125)		(0.0327)	
I(layoff period≥Sep 2007)	-0.6977	***	-1.4488	***	0.3865	***	0.5228	***
	(0.0110)		(0.0209)		(0.0130)		(0.0220)	
I(age≥45)	0.1451	***	0.0846	***	-0.1087	***	-0.1638	***
	(0.0152)		(0.0209)		(0.0164)		(0.0216)	
I(period≥Mar 2006)	-0.2956	***	-0.4768	***	0.1784	***	0.2783	***
	(0.0101)		(0.0179)		(0.0129)		(0.0216)	
age	0.0218	***	0.0136	***	0.0154	***	0.0020	
	(0.0023)		(0.0032)		(0.0026)		(0.0034)	
age square	-0.0007	***	-0.0004	***	-0.0005	***	-0.0002	***
	(0.0000)		(0.0000)		(0.0000)		(0.0000)	
gender	0.4752	***	0.7188	***	0.2483	***	0.4426	***
	(0.0064)		(0.0992)		(0.0069)		(0.1018)	
spouse	0.0630	***	0.1487	***	0.0022		0.0798	***
	(0.0063)		(0.0111)		(0.0068)		(0.0114)	
children	0.0456	***	0.0309	***	0.0311	***	0.0181	***
	(0.0025)		(0.0031)		(0.0027)		(0.0031)	
log of p.u.wage	0.1712	***	0.1549	***	0.3933	***	0.4569	***
	(0.0055)		(0.0105)		(0.0060)		(0.0111)	
Observations	247819		71793		183054		53919	

Source: AUD, see main text and Appendix.

Note: Coefficients are the result of estimating a Cox PH model of unemployment duration on a set of indicator variables that identify the effect of the change in severance pay (SP) as a diff-in-diff method and controls. The indicator variables are: I(entry<Feb 2002) that identify those workers for which severance pay can change (those that begun their employment before February 2002); I(layoff period Sep 2007) those periods of layoffs for which SP can change; and the interaction of the two, which identifies those spells for which SP effectively was reduced after September 2007. Numbers in parentheses are standard deviations of the coefficients. Statistical significance: * significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level.

In this pooled panel over time, we compute for all workers duration in unemployment, measured in weeks, since the beginning of their spell. That is, we take all unemployed workers in the first period of a particular panel and compute the duration in unemployment in weeks until that moment, their incomplete duration. Then we observe these workers for three more periods (quarters). If a worker exits unemployment in any of these three periods we compute his complete duration in unemployment in weeks using tenure in the new firm. If a worker remains in unemployment in all the panel periods, then he has a censored unemployment spell. Therefore, the unemployment duration spell is complete if the worker leaves the unemployment state within the year he is observed, and the unemployment spell is censored if the worker remain unemployed for the four waves in the panel.

Our panel sample has 1,134 individuals, representing more than half a million workers when considering the household survey weights. Among those individuals, 54 percent are males and almost 7 percent are receiving UI transfers. Around 15 percent of the individuals in our sample received SP transfers.

6.2 Time Variation: Changes in Legislation

Figure 19 shows the discontinuity in UI transfers after the reform of March 2006. The solid line in the figure shows the UI transfer between the third quarter of 2003 and the third quarter of 2008. The dotted lines in the figure show the average UI transfer before March 2006 and the average UI transfer after the reform. The average UI transfer before the reform is around AR$ 231 (around 77 US dollars), while the average transfer after the reform is approximately AR$ 339 (equivalent to 113 US dollars). This means a 47 percent increase in the average UI transfer after the reform.

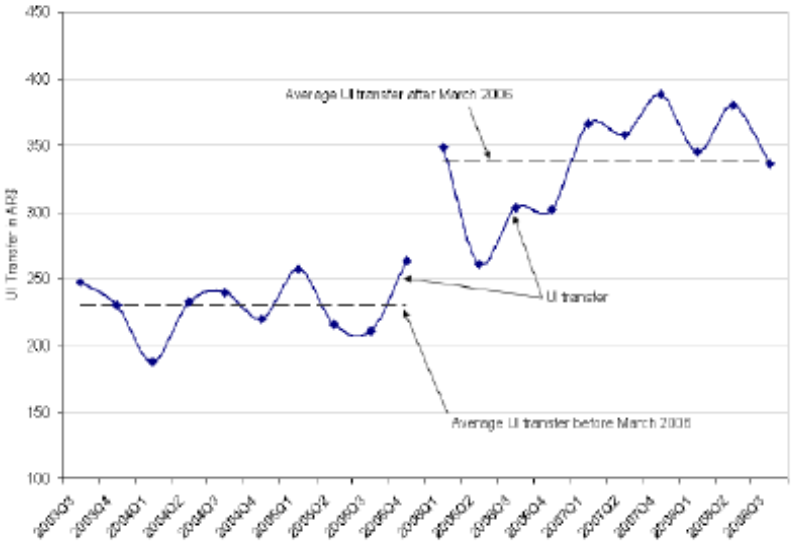
As mentioned above, this labor market reform was implemented in stable economic conditions and can therefore be viewed as an exogenous shock to workers' incentives, setting up the following regression discontinuity approach.

6.2.1 Effects on the Duration of Unemployment

In this section we estimate a Cox proportional hazard model to evaluate the impact on unemployment duration of the increase in UI transfers in March 2006. The Cox proportional hazard model includes as policy variables: unemployment insurance, $E_{UI} \equiv I(UI = 1)$, severance payment, $E_s \equiv I(SP = 1)$, and an interaction variable between the unemployment insurance and a dummy variable indicating the change in UI legislation in March 2006, $E_{UI} \times I(t > \text{March } 2006)$. We also include as exogenous control variables, x, gender, age and its square, formal education and time dummy variables. Then, the model is:

$$\theta(t_u|x) = \lambda(t_u)\exp(x\beta + y\gamma) \tag{6}$$

Figure 19. UI Transfers as Measured by the EPH



Source: Authors' calculations using EPH.

with

$$y\gamma = \gamma_1 E_{UI} + \gamma_2 E_s + \gamma_3 E_{UI} \times I(t > \text{March } 2006)$$

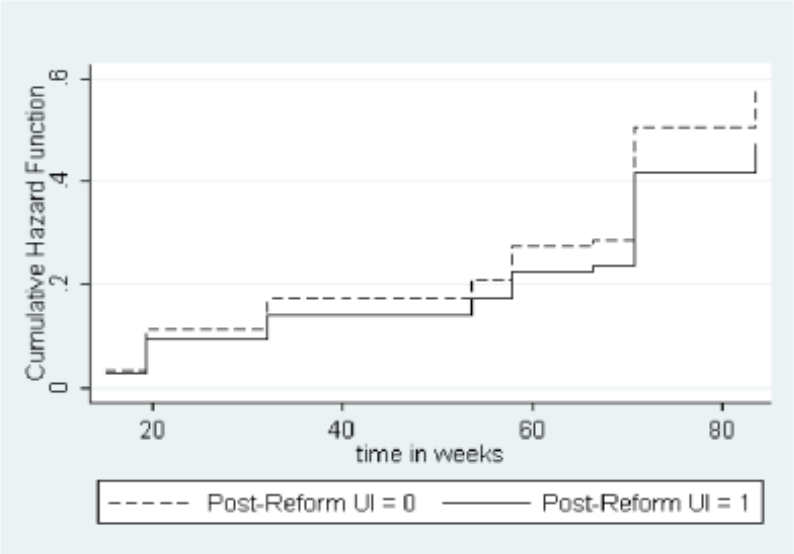
where γ_1 measures the effect of pre-reform UI recipiency, γ_2 measures the effect of severance payment and γ_3 measures the effect of the increase in UI benefit given by the 2006 reform. As stressed before, if the reform of March 2006 was indeed exogenous to workers' incentives, then γ_3 will pick up the causal effect of the reform on the duration of unemployment.[32]

The results of our estimations appear in Table 21. Column (1) shows the estimation of the Cox model for the pooled panel data described above, and column (2) presents the estimation restricting the panel to workers between 30 and 55 years old. This last restriction has the objective of having workers with even more similar characteristics.

The increase in UI benefits provided by the 2006 reform decreases the hazard of leaving unemployment. This effect is larger for the restricted sample. Estimations of γ_3 suggest an increment in the duration of unemployment between 20 and 100 percent, considering the estimations in column (1) and (2), respectively. The impact of receiving severance payment on the finding rate is positive. This means that receiving SP transfers decreases the duration of unemployment. As explained above, SP transfers can be used to measure the unconditional initial transfer measuring

[32]Note that this model is different from that of equation 4. The reason is that our analysis with administrative data includes only UI beneficiaries, while in this case we can compare eligible and ineligible workers.

Figure 20. Cumulative Hazard Functions by After-Reform UI Recipiency 85



Source: Authors' calculations using EPH.

the "liquidity effect" of the UI system. If this is the case, our estimations suggest that the liquidity effect increases the finding rate between 6.5 percent and 22 percent, considering the estimations in column (2) and (1), respectively.

The results in Table 21 (using column (1)) can be summarized with the aid of some plots. As the results presented in Table 21 suggest, the increment in the benefits of the reform of 2006 had a negative effect on the finding rate. This means that the cumulative hazard of leaving unemployment, shown in Figure 20, increases at a higher rate for those workers who do not claim UI after March 2006.

Figure21 shows that the cumulative hazard for workers who received severance payments increases at higher rate than for those workers who did not receive it, as was implied by the estimates in column (1) of Table 21.

Overall, these results suggest that the inccrease in UI benefits after March 2006 increased the duration of unemployment, while receiving severance payment or the liquidity effect of the UI system had a positive effect on the finding rate.

6.2.2 Effects on the Transition from Unemployment to Informality

So far the duration estimations have focused on the time in an unemployment spell, analyzing only transitions into employment. Here we implement a competing risk analysis, distinguishing four different destination states: formal employment in the first postdisplacement job, informal

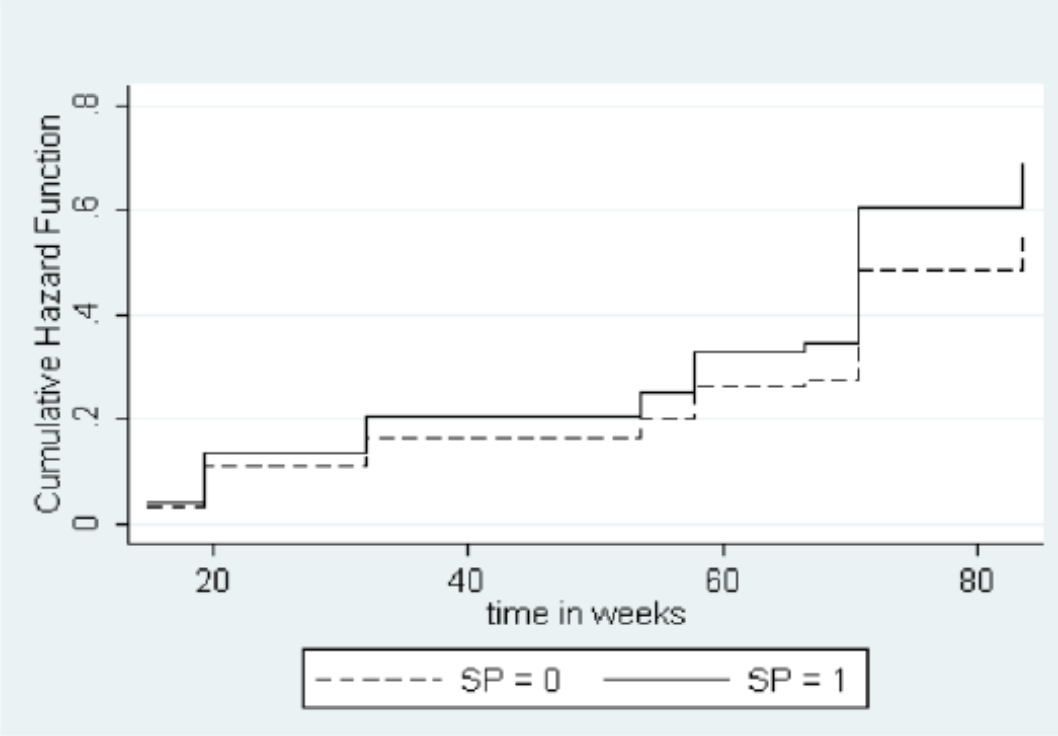
Table 21. Cox Proportional Hazard Model Estimation: Changes in Legislation

Dependent variable: Duration in weeks	(1)	(2)
Unemployment insurance (E_{UI})	-0.007	0.451***
	(0.015)	(0.018)
$E_{UI}\ x\ I(t > March2006)$	-0.196***	-0.995***
	(0.021)	(0.030)
Severance payment (E_s)	0.219***	0.065***
	(0.009)	(0.012)
Gender (male=1)	-0.030***	-0.135***
	(0.006)	(0.011)
Age	0.014***	-0.458***
	(0.002)	(0.009)
Age^2	-0.000**	0.006***
	(0.000)	(0.000)
Education		
Complete Primary	1.175***	1.170***
	(0.029)	(0.031)
Incomplete Secondary	0.744***	0.507***
	(0.029)	(0.033)
Complete Secondary	1.466***	1.479***
	(0.028)	(0.031)
Incomplete Superior	1.195***	0.627***
	(0.029)	(0.033)
Complete Superior	0.714***	1.170***
	(0.029)	(0.032)
Time dummies	Yes	Yes
Observations	566,151	215,233

Source: Authors' calculations using EPH.

Note: Table shows estimation of equation (6). Figures in parentheses are robust standard errors. * 10% statistical significance; ** 5% statistical significance and *** 1% statistical significance. The number of observations is computed using the EPH weights.

Figure 21. Cumulative Hazard Functions by SP



Source: Authors' calculations using EPH.

employment in the first postdisplacement job, self-employment in the first postdisplacement job, and out of the labor force. Therefore, we relax the assumption that the hazard function does not depend on the destination state and consider instead a competing risks formulation in which four competing risks determine the duration of unemployment. We estimate a competing risk model using the Fine and Gray (1999) approach. They posit a model for the hazard of the subdistribution for the failure event of interest, known as the subhazard. The model is semiparametric in that the baseline subhazard (that for covariates set to zero) is left unspecified, while the effects of the covariates are assumed to be proportional. Competing-risks regression performed in this manner is quite similar to Cox regression. Here we estimate a subhazard for each of the destination states. The results are presented in Table 22.

Column (1) of the table presents the subhazard estimation for the formal employment event. Column (1) of the table presents the subhazard estimation for the self-employment destination state. Column (3) of the table shows the subharzard estimation for the informal employment event and column (4) presents the subhazard estimation for the out of labor force failure state.

As is clear from the table, the UI reform of March 2006 has a negative effect on the transition out of unemployment whether the worker ends up in an informal or self-employment job, but it has a positive effect on the subhazard of those workers transiting to a formal job. In this case claiming UI benefits after March 2006 increases the subhazard of formal employment by 59 percent. To put this number into context, consider the cumulative incidence function presented in Figure 22. As the figure shows, the eventual probability that a worker receiving UI benefits after the reform finds a formal job after one year is about 50 percent, while that probability for workers who do not claim UI benefits after the reform is only 10 percent.

This evidence suggests that the increment in UI benefits on March 2006 accelerates the transition into formal jobs and reduces the probability of getting an informal job. This effect is not totally unexpected, since our sample consists of workers coming from formal jobs and having been in unemployment for a short period of time.

However, the same reform had a negative effect on the transition out of unemployment for those workers transiting to informal and self-employment jobs. Figure 23 shows the cumulative incidence function of informal employment. The eventual probability of finding an informal job after one year in the case that the worker does not receive UI benefits after March 2006 is around 15 percent, while for those workers receiving UI benefits this probability is only 5 percent.

The extension of UI benefits for workers older than 45 years of age seems to increase the transition towards inactivity, while reducing the subhazards of leaving unemployment to get formal, informal and self- employment jobs.

Finally, Table 22 also suggests that the liquidity effect of the UI benefit, as measured by the SP transfer, decreases the subhazard of leaving unemployment for those workers transiting to

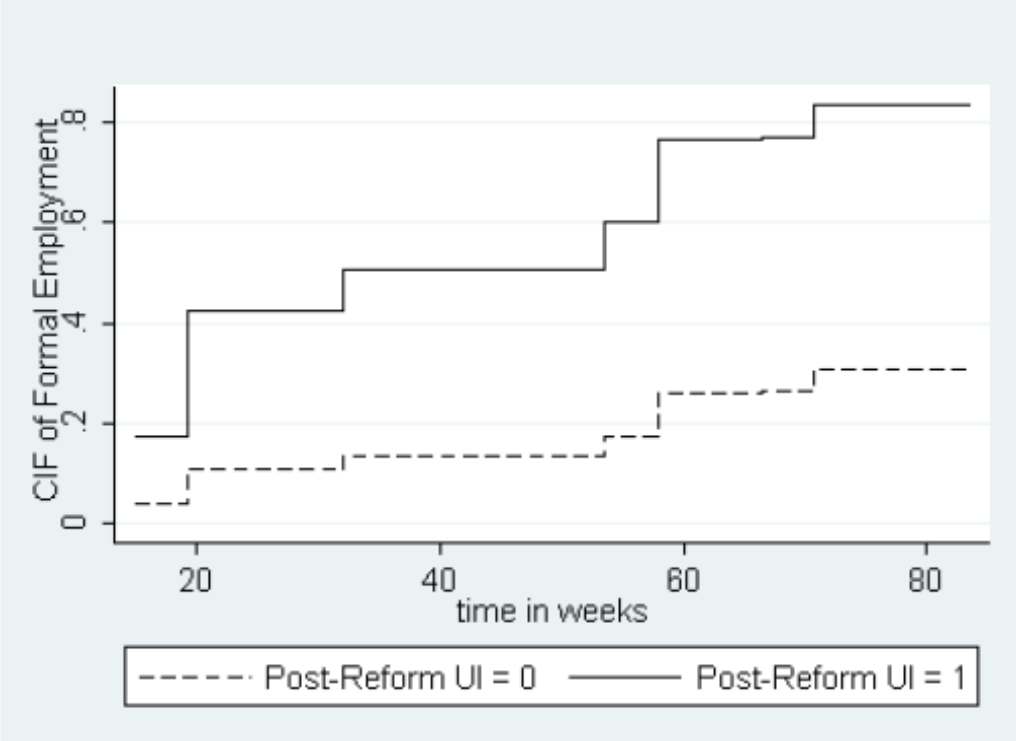
Table 22. Competing Risks Proportional Hazard Model Estimation

Dependent variable: Duration in weeks	Formal Employment (1)	Self Employment (2)	Informal Employment (3)	Out of Labor Force (4)
Unemployment insurance (E_{UI})	-1.072***	1.458***	0.306***	-1.082***
	(0.024)	(0.022)	(0.014)	(0.027)
$E_{UI}\ x\ I(t > March2006)$	1.585***	-1.492***	-0.942***	
	(0.026)	(0.026)	(0.021)	
$E_{UI}\ x\ I(Age \geq 45)$	-2.787***	-0.835***	-1.601***	1.853***
	(0.114)	(0.033)	(0.048)	(0.032)
Severance payment (E_s)	-0.415***	-0.114***	0.357***	-0.277***
	(0.009)	(0.012)	(0.007)	(0.012)
Gender (male=1)	0.273***	1.247***	0.015**	-1.008***
	(0.005)	(0.013)	(0.005)	(0.007)
Age	0.050***	0.196***	-0.023***	-0.106***
	(0.002)	(0.003)	(0.001)	(0.002)
Age^2	-0.001***	-0.002***	0.000***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Education				
Complete Primary	0.210***	-0.301***	-0.502***	0.254***
	(0.019)	(0.022)	(0.012)	(0.029)
Incomplete Secondary	0.676***	-0.849***	-0.498***	0.353***
	(0.019)	(0.024)	(0.012)	(0.029)
Complete Secondary	0.284***	-0.897***	-0.298***	0.059*
	(0.019)	(0.022)	(0.012)	(0.029)
Incomplete Superior	0.441***	-0.564***	-1.008***	0.686***
	(0.019)	(0.025)	(0.013)	(0.029)
Complete Superior	1.079***	-0.446***	-0.840***	-0.326***
	(0.019)	(0.022)	(0.013)	(0.030)
Time dummies	Yes	Yes	Yes	Yes
Observations	566151	566151	566151	566151

Source: Authors' calculations using EPH.

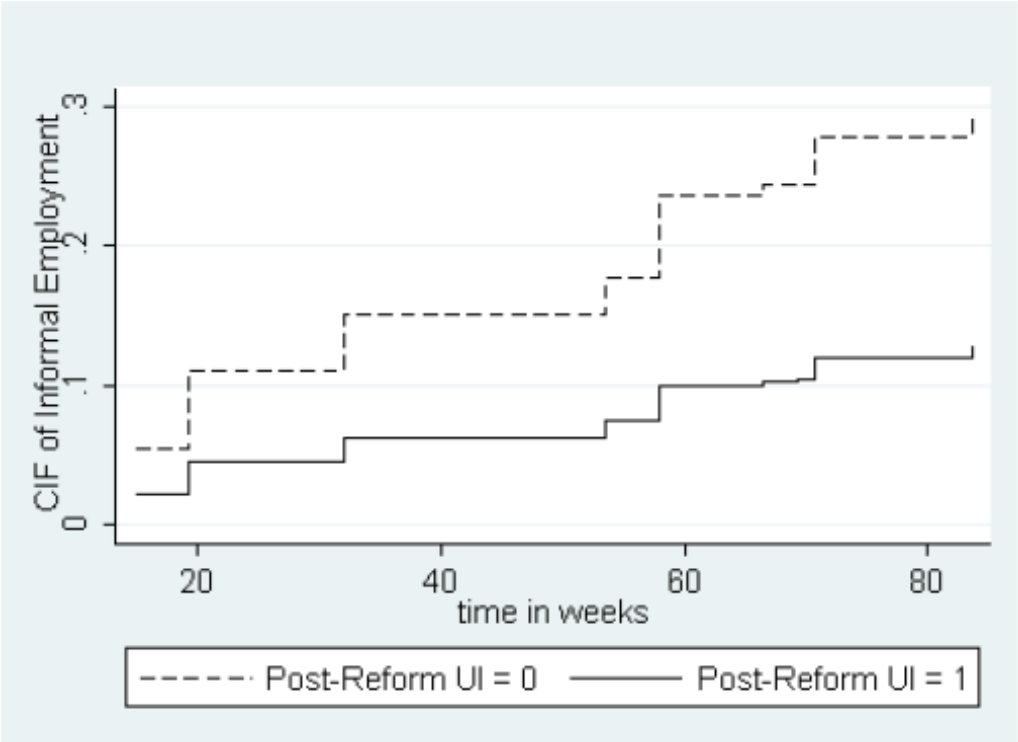
Note: Figures in parentheses are standard errors. *** 1% statistical significance. The interaction between UI and $I(t > March2006)$ does not appear in the last column estimation due to lack of observations.

Figure 22. Cumulative Incidence Function of Formal Employment



Source: Authors' calculations using EPH.

Figure 23. Cumulative Incidence Function of Informal Employment



Source: Authors' calculations using EPH.

a formal or self- employment job and for those leaving unemployment to go out of the labor force, while this effect accelerates the transition out of unemployment and into an informal job by around 36 percent.

To investigate further the impact of the severance payment policy we restrict the sample to all workers who become unemployed from the first quarter of 2006 and received severance payment. From these workers we identify those who were dismissed from a job who had started before February 2002, creating two groups: unemployed workers whose last job began before February 2002 (treatment group) and unemployed workers whose last job began after February 2002 (control group). Before September 2007, workers in the treatment group get an SP of 1.5 salaries per year of tenure, while workers in the control group get 1 salary per year of tenure. After September 2007 workers in both groups get 1 salary per year of tenure. To measure the impact of the SP reform of September 2007 on the transition from unemployment to a different state, we estimate a competing risk model, similar to the one presented above, using as policy variables a binary indicator for unemployed workers whose last job began before February 2002, a binary indicator adopting the value one from September 2007 on and the interaction between these two indicators. The coefficient on this interaction term should measure the impact of the change in severance payment from 1.5 salaries per year of tenure to 1 salary per year of tenure. Table 23 shows the results.

The evidence presented in the table suggests that the SP reform of September 2007 accelerates the transition out of unemployment and into a formal or self-employment job while reducing the probability of finding an informal job or going into inactivity. This means that reducing the SP transfer would increase the duration of unemployment for those workers looking for an informal job or going into inactivity but decrease the duration of unemployment for those workers transiting from unemployment to formal or self-employment jobs. These results could explain why when using administrative data we did not find a statistically significant effect of the September 2007 reform on the duration of unemployment. It could be the case that both effects cancel out over the aggregate.

6.3 Cross-Sectional Variation: Eligibility Conditions

As mentioned above, there is a discontinuity in UI recipiency at age 45. Workers 45 years or older receive UI support for 6 additional months. In order to study this cross-sectional variation we take the pooled panel sample of unemployed workers over time and restrict it to all unemployed workers who came from formal jobs, have been unemployed for less than five months the first time they are observed and are between 42 and 47 years old. The idea behind these restrictions is to compare similar groups of workers when using a regression discontinuity approach. The group of unemployed workers 42 to 44 years of age, our control group, is compared with the group of workers between 45 and 47, our treatment group.

Table 23. Competing Risks Proportional Hazard Model Estimation: SP Effect

Dependent variable: Duration in weeks	Formal Employment (1)	Self Employment (2)	Informal Employment (3)	Out of Labor Force (4)
Last employment began before Feb. 2002	-0.113***	-0.123***	0.301***	-0.314***
	(0.015)	(0.020)	(0.013)	(0.034)
Last employment began before Feb. 2002	0.766***	0.161***	-0.619***	-0.538***
$x\ I(t > Sep.2007)$	(0.021)	(0.028)	(0.028)	(0.061)
$I(t > Sep.2007)$	-0.494***	-0.651***	0.489***	-2.414***
	(0.015)	(0.017)	(0.015)	(0.059)
Gender (male=1)	-0.297***	-0.885***	0.986***	1.224***
	(0.011)	(0.014)	(0.014)	(0.036)
Age	0.003*	0.006*	-0.002	0.502***
	(0.001)	(0.003)	(0.001)	(0.010)
Age^2	0.000***	-0.000***	0.000***	-0.006***
	(0.000)	(0.000)	(0.000)	(0.000)
Education				
Complete Primary	1.347***	0.236***	-0.412***	-2.271***
	(0.056)	(0.043)	(0.016)	(0.044)
Incomplete Secondary	2.069***	0.400***	-1.415***	-3.266***
	(0.055)	(0.043)	(0.020)	(0.059)
Complete Secondary	1.190***	-0.409***	-1.214***	-2.266***
	(0.055)	(0.043)	(0.017)	(0.032)
Incomplete Superior	1.507***	0.103*	-1.089***	-3.733***
	(0.056)	(0.044)	(0.020)	(0.074)
Complete Superior	1.235***	0.521***	-1.307***	-1.973***
	(0.057)	(0.045)	(0.025)	(0.034)
Time dummies	Yes	Yes	Yes	Yes
Observations	264221	264221	264221	264221

Source: Authors' calculations using EPH.

Note: Figures in parentheses are standard errors. *** 1% statistical significance. Sample includes all unemployed workers from the first quarter of 2006 that received SP.

We estimate a Cox proportional hazard model using as policy variables a dummy variable for workers between 42 and 44 years old who have UI benefits, $E_{UI} \times I(Age < 45)$, and an indicator variable for workers between 45 and 47 years old who have UI benefits, $E_{UI} \times I(Age \geq 45)$. The coefficient associated with this last variable would measure the impact of the extension of UI benefits on the duration of unemployment in a sharp jump regression discontinuity design. We also include the dummy variable indicating the change in UI legislation in March 2006, $E_{UI} \times I(t > \text{March } 2006)$ and the same control variables as in the previous estimations, gender, age and its square, formal education and time dummy variables.

$$\theta(t_u|x) = \lambda(t_u)\exp(x\beta + y\gamma) \tag{7}$$

with

$$y\gamma = \gamma_1 E_{UI} \times I(Age < 45) + \gamma_2 E_{UI} \times I(Age \geq 45) + \gamma_3 E_{UI} \times I(t > \text{March } 2006)$$

Notice that it is possible, although very unlikely, that the worker lies about his/her age in the UI application and the authorities do not cross-check that claim. If this is the case, there will be some fuzziness around the age of 45. Since there is no reason to lie about the workers' age in a household survey we instrument the indicator variable for workers between 45 and 47 years old who have UI benefits with the dummy variable $I(Age \geq 45)$ in a Cox PH IV duration model.[33] We use a two-stages least squares (TSLS) estimation. In the first stage we estimate a linear probability model with dependent variable the indicator for workers between 45 and 47 years old who have UI benefits and with regressors the dummy variable $I(Age \geq 45)$, gender, age and its square, educational dummies and time effects and obtain the predicted values of $E_{UI} \times I(Age \geq 45)$. In the second stage we estimate a Cox PH model replacing the potential endogenous variable $E_{UI} \times I(Age \geq 45)$ by its predicted value from the first stage.

Table 24 shows the results of our estimations. Column (1) in the table shows the traditional Cox proportional hazard estimation, while column (2) shows the same estimation but using the TSLS approach. Both estimations are similar, indicating that receiving six more months of UI support reduces the hazard of leaving unemployment by approximately 35 percent. These estimations imply that workers older than 44 years of age who claim UI benefits have a longer duration in unemployment than a comparable group of workers receiving UI benefits who are less than 45 years old.

Notice that the effect of the increase in UI benefit given by the 2006 reform reduces the hazard of leaving unemployment. This evidence is consistent with the duration results presented

[33] We want to thank Sebastián Galiani for helping us to come up with this RD fuzzy estimation approach.

Table 24. Cox Proportional Hazard Model Estimation: Eligibility for Benefits

Dependent variable: Duration in weeks	(1)	(2)
$E_{UI}\ x\ I(Age < 45)$	1.107***	1.299***
	(0.051)	(0.046)
$E_{UI}\ x\ I(Age \geq 45)$	-0.347***	-0.376
	(0.035)	(0.300)
$E_{UI}\ x\ I(t > March2006)$	-0.360***	-0.546***
	(0.049)	(0.045)
Severance payment (E_s)	0.500***	0.450***
	(0.022)	(0.044)
Gender (male=1)	0.113***	0.118***
	(0.020)	(0.021)
Age	2.991***	3.069***
	(0.200)	(0.234)
Age^2	-0.033***	-0.034***
	(0.002)	(0.003)
Education		
Complete Primary	3.266***	3.223***
	(0.119)	(0.130)
Incomplete Secondary	3.458***	3.438***
	(0.119)	(0.121)
Complete Secondary	4.064***	4.065***
	(0.119)	(0.134)
Incomplete Superior	2.967***	2.929***
	(0.124)	(0.125)
Complete Superior	3.531***	3.532***
	(0.119)	(0.121)
Time dummies	Yes	Yes
Observations	84,247	84,247

Source: Authors' calculations using EPH.

Note: The table shows the estimation of equation (7). Column (1) presents the traditional Cox PH estimation and column (2) uses the instrumental variables estimation as explained in the main text. Figures in parentheses are robust standard errors. * 10% statistical significance; ** 5% statistical significance and *** 1% statistical significance. The number of observations is computed using the EPH weights.

above. For this particular group of workers, the increase in UI benefits after March 2006 increases the duration of unemployment between 36 and 55 percent, considering the estimations in columns (1) and (2), respectively.

Overall, the empirical evidence presented in this section suggests that the UI reform of March 2006 seems to have increased the duration of unemployment. This effect appears to be explained by the transition out of unemployment and into self-employment and informal jobs. Additionally, the evidence also suggests that the UI benefit extension for workers older than 44 years of age increases the duration of unemployment.

6.4 Effects on Employed Workers

In this section we analyze the impact of SP and UI policies on **separation probability**. In particular, severance pay is a firing cost that can reduce separations. In fact, this was the argument behind the shift in severance pay in 2002: to reduce layoffs at a particularly critical time.

Additionally, the unemployment insurance benefit (particularly a generous one) could increase separations: effort on the job could be reduced given that unemployment insurance is available. While this is perhaps of second order in the analysis of unemployment insurance policy, it could be important to identify this effect.

As a first approach we used the Encuesta de Indicadores Laborales (EIL)[34] to construct a time series of aggregate separation rates. Figure 24 shows the aggregate separation rate along with the shifts in SP in February 2005, November 2005 and September 2007. As shown in the figure, after each of these reductions in the number of monthly salaries per year of tenure we observe a jump in separation rates. After February 2005, when the SP decreased from 2 to 1.8 monthly salaries per year of tenure, and after November 2005, when the reduction was from 1.8 to 1.5, the separation rate increased more than 30 percent in the following month; after the reduction from 1.5 to 1 monthly salaries per year of tenure, the separation rate increased 7 percent in the following month and almost 40 percent in the following two months. The vertical line in March 2006 shows the date of the UI reform. After March 2006 the separation rate decreased in the following months.

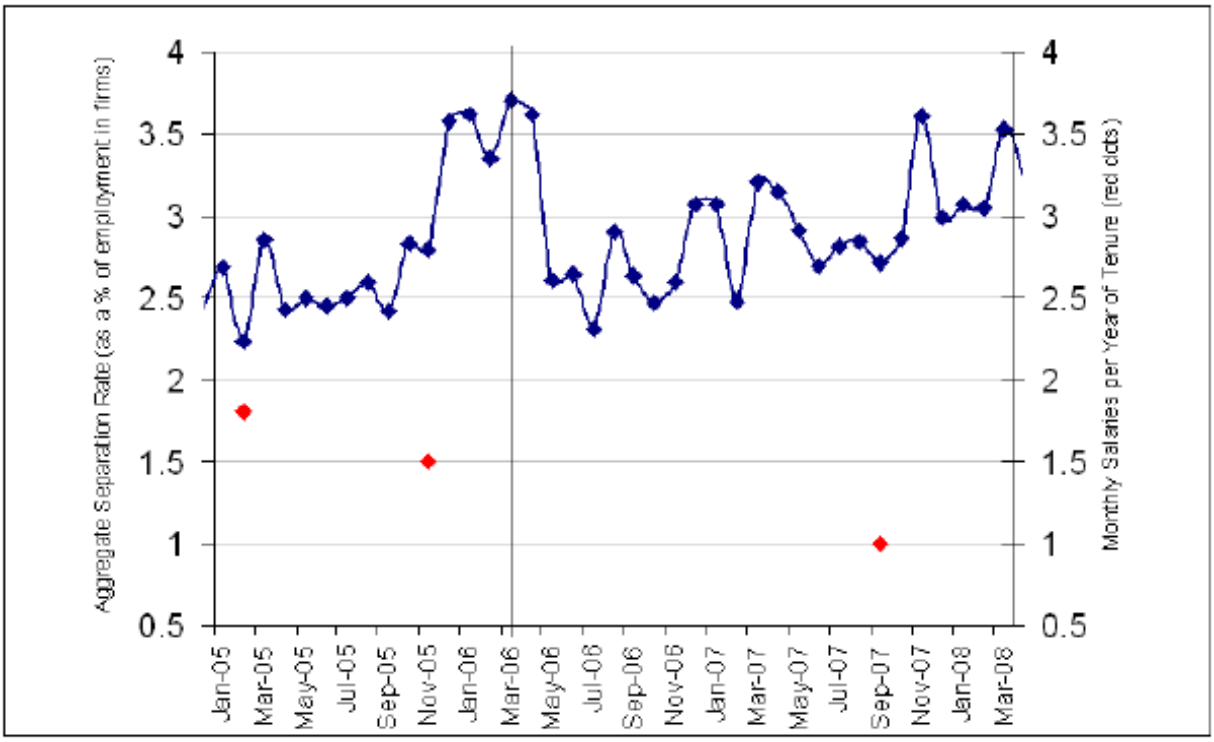
Next, we will try to understand if these stylized facts observed for the aggregate separation rate can be explained by the reforms to SP and UI legislation.

6.4.1 Effects of SP on Separation Probability

Using the Permanent Household Survey (EPH) we constructed a panel data set to study the impact of the SP reform of 2007. Law No. 25972 established that the level of severance, 1.5 monthly salaries per year of tenure for workers who were hired before February 2002, will automatically end when the unemployment rate falls below 10 percent. In September 2007 the unemployment

[34] EIL is a monthly establishment-level survey, conducted by the Ministry of Labor, in which firms in the most important urban areas are asked about employment, separations, hirings, hours worked and wages.

Figure 24. Aggregate Separation Rates



Source: Authors' calculations using EPH.

rate effectively became lower than 10 percent, and hence, after that date severance pay returned to its original level of 1 monthly salary per year of tenure.

We took all formal workers, defined as those workers that were covered by social security, in the fourth quarter of 2006 and follow them through the first quarter of 2007. These same workers reenter the EPH in the fourth quarter of 2007, and we follow them through the first quarter of 2008. Therefore we observe workers two quarters before the SP reform and two quarters after that reform. We define two groups: the so-called treatment group composed of workers hired before February 2002 and the control group composed of workers hired after February 2002. The treatment group of workers is affected by the change in the SP legislation.

The outcome variable is a binary indicator of a change in the labor condition of the worker from the fourth quarter of 2006 to the first quarter of 2007 and from the fourth quarter of 2007 to the first quarter of 2008. In particular, the variable we call separation adopts the value one if the individual goes from formal worker in the fourth quarter of 2006 (2007) to be unemployed, inactive, informal worker or changed her job in the formal sector during the first quarter of 2007 (2008). The variable adopts the value zero for all other cases. The treatment indicator variable (I_{it}) adopts the value one for those workers hired before February 2002 in the quarters after the implementation of the SP reform and adopts the value zero for all other cases.

We estimated a difference-in-differences model specified as a two-way fixed effect linear regression model:

$$\text{Separation}_{it} = \alpha_i + \lambda_t + \beta I_{it} + \pi I(E \text{ before Feb. } 2002) + X'_{it}\gamma + u_{it}, \;\; i = 1, \cdots, N; \;\; t = 1, 2. \quad (8)$$

where α_i is an individual fixed effect, λ_t is a time effect, $I(E \text{ before Feb. } 2002)$ is an indicator variable adopting the value one if the worker was hired before February 2002, X_{it} are control variables and u_{it} is the residual term. $t = 1$ indicates the period before the SP reform. The parameter β measures the effect of the SP reform on separation probability. A negative value for β indicates that the SP reform increased the separation probability from formal employment for workers in the treatment group.

Since our outcome variable is a binary indicator we also estimated a difference-in-differences Logit model.

Table 25 and Table 26 show the results of our estimations. Columns (1) and (2) in Table 25 show the estimation of equation (8) for the complete panel and columns (3) and (4) the estimation restricting the sample to workers between 30 and 55 years of age. Columns (1) and (3) are the baseline specifications and columns (2) and (4) use as control variables six dummy variables for formal education and tenure.

In all specifications of 25, the coefficient on the treatment variable is negative, although not statistically significant, implying that those workers hired before February 2002 had a lower probability of separation than those workers hired after February 2002. In particular, workers hired before February 2002 seem to have, on average, between 2 and 5.5 percent less probability of being separated from their jobs than workers hired after February 2002.

Table 26 shows the estimation of equation (8) but using a Logit model. As before, columns (1) and (2) present the estimation for the complete panel and columns (3) and (4), the estimation restricting the sample to workers between 30 and 55 years of age. In all specifications the coefficient on the treatment variable is negative and statistically significant, indicating that workers hired before February 2002 had less probability of being separated from their jobs than workers of similar characteristics but that were hired after February 2002. In particular the odds ratios are between 1.3 and 1.8 implying that workers hired before February 2002 are between 22 and 45 percent less likely to be separated from their jobs than workers of similar characteristics hired after February 2002.

6.4.2 Effects of UI on Separation Probability

The monthly UI benefit the worker receives is equal to half of her best salary during the last 6 months of employment, but should also fall within a minimum and maximum thresholds established by the National Council of Employment, Productivity and Minimum Wage. These thresholds were changed in March 2006. Before the UI reform the thresholds were 150 and 300 pesos. Since March 2006, the thresholds are 250 and 400 pesos. In this section we study the impact of the UI reform of 2006 on separation probability using a pooled cross-section sample.

We take all formal workers, defined as workers covered by social security, in the second quarter of 2005 and follow them through the third quarter of 2005. We also consider all formal workers in the second quarter of 2006 and follow them through the third quarter of 2006. Therefore we have two quarters before the UI reform and two quarters after that reform. We pooled this cross-section sample over time.

The outcome variable is a binary indicator of a change in the labor condition of the worker from the second quarter of 2005 to the third quarter of 2005 and from the second quarter of 2006 to the third quarter of 2006. In particular this variable that we called separation adopts the value one if the individual goes from formal worker in the second quarter of 2005 (2006) to being unemployed, inactive, an informal worker or changed her job in the formal sector during the third quarter of 2005 (2006). The variable adopts the value zero for all other cases. We measure the effect of the unemployment insurance reform of March 2006 on the probability of separation using an indicator variable adopting the value one for those workers that are eligible to receive UI after March 2006 and adopts the value zero for all other cases ($E_{UI} \times I(t > \text{March } 2006)$). The coefficient on this variable measures the effect of the UI reform of March 2006 on the probability of separation.

Table 25. Effect of SP Reform on Separation Rate

Dependent variable: Separation	(1)	(2)	(3)	(4)
I_{it}	-0.024	-0.019	-0.055	-0.048
	(0.031)	(0.031)	(0.042)	(0.041)
$I(E$ before Feb. $2002)$	0.345***	0.330***	0.353***	0.340***
	(0.044)	(0.047)	(0.051)	(0.060)
Incomplete Primary		0.237		-0.026
		(0.193)		(0.037)
Complete Primary		0.220		-0.017
		(0.194)		(0.021)
Incomplete Secondary		0.192		-0.013
		(0.203)		(0.097)
Complete Secondary		0.150		0.011
		(0.210)		(0.103)
Incomplete University		0.061		-0.002
		(0.218)		(0.131)
Complete University		0.079		0.057
		(0.220)		(0.143)
Tenure		0.013		0.016
		(0.018)		(0.031)
Fixed Effects	Yes	Yes	Yes	Yes
Time Effects	Yes	Yes	Yes	Yes
Average separation rate	14.4%	14.4%	14.4%	14.4%
Observations	2041856	2041856	1397876	1397876

Source: Authors' calculations using EPH.

Note: Columns (1) and (2) show estimation of equation (8) over the complete panel and columns (3) and (4) show the estimation restricting the sample to workers between 30 and 55 years old. Figures in parentheses are robust standard errors. *** 1% statistical significance; ** 5% statistical significance; * 10% statistical significance. The average separation rate was computed for workers hired before February 2002 in the period before the SP reform.

Table 26. Effect of SP Reform on Separation Rate: Logit Estimation

Dependent variable: Separation	(1)	(2)	(3)	(4)
I_{it}	-0.288***	-0.266***	-0.575***	-0.411***
	(0.011)	(0.011)	(0.015)	(0.017)
Marginal Effect	0.043	0.017	0.039	0.001
$I(E$ before Feb. $2002)$	2.480***	2.525***	3.596***	4.543***
	(0.016)	(0.020)	(0.034)	(0.047)
Complete Primary		1.602***		3.200***
		(0.050)		(0.092)
Incomplete Secondary		1.626***		2.824***
		(0.054)		(0.097)
Complete Secondary		1.153***		3.411***
		(0.053)		(0.101)
Incomplete University		-0.239***		2.687***
		(0.054)		(0.100)
Complete University		0.117*		3.950***
		(0.054)		(0.102)
Fixed Effects		0.068***	Yes	Yes
Time Effects		(0.007)	Yes	Yes
Average separation rate	14.4%	14.4%	14.4%	14.4%
Observations	426004	426004	263820	263820

Source: Authors' calculations using EPH.

Note: Columns (1) and (2) show the Logit estimation of equation (8) over the complete panel and columns (3) and (4) show the estimation restricting the sample to workers between 30 and 55 years old. Figures in parentheses are standard errors. *** 1% statistical significance; ** 5% statistical significance; * 10% statistical significance. The average separation rate was computed for those workers hired before February 2002 in the period before the SP reform. Control variables do not include tenure because there are not enough degrees of freedom to compute the marginal effects.

We estimate two models a baseline model with no covariates and a model using age and its squared, gender and six educational attainment dummy variables. We perform estimations using Ordinary Least Squares and a Logit model.

Table 27 shows the results of our estimations. Columns (1) and (2) present the OLS estimations of the baseline specification and the model including controls, respectively. Columns (3) and (4) show the Logit estimation of the baseline model with no controls in column (3) and the complete model in column (4). In all specifications the coefficient on the variable measuring the increase in UI benefits of March 2006 is positive and statistically significant. This result implies that the UI reform increases the probability of separation. However the effect is small in magnitude, as we should have expected, since the marginal effect is only about 3 percent.

Overall, the empirical evidence presented in this section supports the idea that severance payment reduce separations and increases in UI benefits increase them. However, the latter effect is small.

7 Conclusion

Government policies aimed at protecting workers against unemployment usually have several objectives and face multiple trade-offs. For example, unemployment insurance allows for consumption smoothing in the presence of imperfect financial markets, but it also can reduce search effort and increase unemployment duration. Severance payment increases the cost of firing and hence reduces layoffs, which can be particularly convenient during economic crisis, but it also can reduce labor demand. Furthermore, in countries with weak enforcement, these regulations can contribute to noncompliance and a segmented labor market. In the absence of solid empirical evidence, it is unclear how policymakers should react.

We began by describing the composition and evolution of the Argentine labor market and unemployment protection policies, which includes severance payments, contributory unemployment insurance, and active labor policies. In particular, we document the substantial changes that these policies underwent during the last two decades.

To estimate the impact of unemployment insurance and severance pay we used a number of discontinuities in labor policies. First, workers 45 years or older are automatically granted a 6-month extension in unemployment insurance. Second, the length of UI coverage discontinuously changes depending on worker's past contributions. Third, UI benefits increased substantially in March 2006. Fourth, severance payment benefits also experienced a large change but only for workers hired before February 2002. In other words, unemployment protection policies in Argentina provide a number of natural experiments that we exploit to estimate how workers behave.

From Social Security records, we constructed a database consisting of a panel of workers covered by UI during their unemployment spells. This information allows us to construct variables

Table 27. Effect of UI Reform on Separation Rate

Dependent variable: Separation	(1)	(2)	(3)	(4)
Unemployment insurance (E_{UI})	-0.129***	-0.089***	-0.773***	-0.516***
	(0.001)	(0.001)	(0.004)	(0.004)
$E_{UI}\ x\ I(t > March2006)$	0.031***	0.034***	0.156***	0.185***
	(0.002)	(0.002)	(0.008)	(0.008)
Marginal Effect			0.023	0.027
$I(t > March2006)$	-0.006***	-0.005***	-0.041***	-0.041***
	(0.000)	(0.000)	(0.003)	(0.003)
Age		-0.025***		-0.160***
		(0.000)		(0.001)
Age^2		0.000***		0.002***
		(0.000)		(0.000)
Gender (male=1)		0.013***		0.099***
		(0.000)		(0.003)
Education				
Incomplete Primary		-0.211***		-0.968***
		(0.009)		(0.038)
Complete Primary		-0.278***		-1.394***
		(0.009)		(0.037)
Incomplete Secondary		-0.279***		-1.413***
		(0.009)		(0.037)
Complete Secondary		-0.293***		-1.515***
		(0.009)		(0.037)
Incomplete University		-0.273***		-1.378***
		(0.009)		(0.037)
Complete University		-0.299***		-1.569***
		(0.009)		(0.037)
Constant	0.286***	1.039***	-0.908***	3.491***
	(0.001)	(0.009)	(0.004)	(0.040)
Time Effects	Yes	Yes	Yes	Yes
Observations	3257433	3257433	3257433	3257433

Source: Authors' calculations using EPH.

Note: Columns (1) and (2) show OLS estimations and columns (3) and (4) show the Logit estimations. Figures in parentheses are standard errors. Robust standard errors in columns (1) and (2) *** 1% statistical significance; ** 5% statistical significance; * 10% statistical significance.

for pre-unemployment and reemployment jobs. We finally work with a set of 250 thousand spells with detailed data on UI provision and labor history. The use of this type of data for policy evaluation is new for Argentina. In particular, the Unemployment Beneficiaries database has not been previously used for other than administrative purposes.

From household survey data we constructed a panel of unemployed workers to analyze the effect of unemployment insurance and severance pay reforms on unemployment duration. We also constructed a panel of employed workers and followed them to see transitions out of employment; we additionally used this panel to analyze how severance pay and unemployment insurance affect separation rates.

We then provide estimates of the effects of severance payments and unemployment insurance on the following outcomes: duration of unemployment, transitions from unemployment to other labor status, and the separation probability of employed workers.

The main findings are that the extension of unemployment insurance provision significantly and substantially affects unemployment duration. In particular, an additional month of unemployment insurance implies a reduction of finding rate from 16 percent to 8 percent. On the other hand, more generous benefits reduces finding rates significantly, with an elasticity of around 0.6, which is relatively high compared to estimates for other countries. Nevertheless, it is important to stress that increasing benefits by 10 percent would generate a lower reduction in finding rate than increasing one month unemployment duration, while the potential cost of both changes are similar.

This type of result, similar to that in Lalive, van Ours and Zweimueller (2006), suggests that the tradeoff between liquidity provision and disincentives can be moderated by providing higher benefits in a shorter time.

We also found some effect of the change in severance pay on unemployment duration. While this effect is not as robust those of UI, we have found specifications for which the change in severance generated a response of 45 percent of the finding rate. This estimate is important in light of Chetty (2008). This paper interprets severance pay as a pure liquidity provision with no distortion in decisions (a lump-sum transfer, unconditional on the behavior of the unemployed worker). In this sense, Chetty (2008) argues that if workers are responsive to liquidity provision, then the "moral hazard" effect of UI is less important.

On the whole, the main conclusion is that if a reform were to be implemented in Argentina, it should be oriented toward increasing benefits but providing them for shorter time. This conclusion is related to that in Alvarez-Parra and Sanchez (2009), where optimal unemployment insurance provision under hidden labor markets is analyzed. The point of this paper is that, when informality is prevalent, benefits should have a relatively short provision. The intuition is that long UI benefits distort workers' decisions, causing them to accept hidden jobs (of lower quality) to keep benefits and at the same time complement their earnings with some labor income. This type

of moral hazard is particularly damaging if informal jobs have a persistent effect on the quality of workers' participation in the labor market.

For this reason, it is important to provide liquidity for the unemployed that, at the same time, limits the distortion that makes workers search for informal jobs. The way of doing this is by providing shorter and more generous UI transfers. Nevertheless, this has important drawbacks. The first is that UI profiles of this type insure less against the random outcomes of longer spells, which is a main objective of UI. The second is that, extreme instances, a short and generous provision of UI seems to be equated with severance payments, thus duplicating this type of insurance. In any case, given the prevalence of unemployment and the type of income losses that displacements generate, it could be more important to insure workers against job loss rather than for unemployment duration.

8 APPENDIX

8.1 The Unemployment Duration Database

For the duration analysis a special database was constructed, combining information from the three administrative sources: the UI Beneficiaries, SIPA and declared Self-Employed databases. There is a unique identification number that the Social Security system uses to identify workers, the CUIL, and using this number we merged those databases.

In particular, we identified a spell in the UI Beneficiaries database. Then we gathered information on workers' work history both before and after the UI spell. Using this information we identified the last firm (last job) previous to UI spell and construct some variables about this job (tenure, last year wages, location, industry, size of firm, among others). Additionally, we identified the first declared job (whether as wage earner or self-employed) after the beginning of the UI spell, and compute some variables of the reemployment job, such as wages, industry, location and number of contributions in the new job.

Given the amount of information that this process requires, we were able to construct this database just for workers that begun their UI spells after January 2005 and before December 2007. We eliminate from the analysis any spell for which the beginning of the UI spell (first transfer) was not observed or for which the layoff was not clearly related to the beginning UI spell, both because layoff is not observed at all or because it was observed more than 7 months before the UI spell began.

In this way, we constructed the Unemployment Duration database that was used for duration analysis and impact evaluation of policies. Particular variables are described below.

cuil Identification number of the worker

spell Number of UI spell

ntransfer Number of UI transfer of each spell (months in UI)

period Year and month of the UI transfer

age Age of the worker at the moment of the beginning of UI

gender Gender of the worker

type Whether the worker is a permanent worker or a construction worker

spouse Whether the worker has a spouse

children Number of children of the worker

payment Type of payment (in particular if it is regular payment or the lump-sum transfer)

totaltransfers Entitlement of UI duration (number of transfers that the worker is entitled to receive)

maxWage Wage used to compute the UI transfer (best wage of the last 6 months previous to UI)

basictransfer Amount of basic UI transfer

family Amount of family allowances

totaltransfer Amount of total UI transfer

contributions Number of contributions in the three years previous to layoff

tenure Tenure in the last job

tenure_cens Whether tenure is censored

meanWage Mean of wages in the last six months previous to layoff (from SIPA)

maxWage Max of wages in the last six months previous to layoff (from SIPA)

lastWage Wage at the moment of layoff

lastCUIT Last job firm identification number

begining_lastjob Period of the beginning of the last job

end_lastjob Identification number of the worker

location Location of the last job

size Size of the firm of the last job

industry Industry of the firm of the last job

layoff Layoff period

beg_self Period of the first declaration as self-employed after UI

contr_self Number of contributions in the first year of reemployment job as wage earner

beg_wage Period of the first declaration as wage earner after UI

firstWage First wage of reemployment job as wage earner

mean1yearWage Mean of wage in the first year of reemployment job as wage earner

location_reeployment Location of reemployment job

size_reeployment Size of the firm of reemployment job

industry_reeployment Industry of the firm of reemployment job

imputedSP Imputation of severance pay

FirstReemployment Period of the first reemployment job (whether as wage earner or self-employed)

8.2 Age Effect

In this section we show the effect of increasing one year of age. We run a Cox duration model on a dummy of age restricting the sample for two years of age and controls (including gender, the presence of spouse and children in the household, the log of pre-unemployment wage level, the log of imputed severance pay, the number of contributions, tenure, and fixed effects by year, region and industry).

As an example, when analyzing the effect of one additional year of age on duration for 41 years of age we proceed as follows. We generate an identification variable which is one if the age of the worker at the beginning of the spell is 41. Then we restrict the sample to a particular type of worker (permanent or construction) whose age is 40 or 41 years of age. Then we run the duration model. In the following table we report these effects.

We found that the effects of one additional year of age is almost exclusivelly concentrated on the group of 45 years of age (compared to 44 years of age). In particular, those with 45 years of age reduce their finding rate in almost 50 percent in the case of permanent workers and 26 percent in the case of construction workers. Almost all the other changes between years of age are not significant or only marginally significant.

Table A: Effects of an additional year of age

Age	Permanent Workers		Construction workers	
41	-0.1009	**	-0.0853	
	(0.0503)		(0.0726)	
42	0.0574		0.0590	
	(0.0506)		(0.0741)	
43	-0.0910	*	-0.0140	
	(0.0523)		(0.0761)	
44	0.0500		-0.1127	
	(0.0554)		(0.0796)	
45	-0.4794	***	-0.2637	***
	(0.0582)		(0.0844)	
46	0.0531		-0.1921	**
	(0.0593)		(0.0845)	
47	-0.0902		0.0334	
	(0.0645)		(0.0836)	
48	0.0367		-0.0486	
	(0.0675)		(0.0854)	
49	0.0505		-0.0607	
	(0.0681)		(0.0855)	
50	-0.1133		0.1416	
	(0.0706)		(0.0868)	

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