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**The Non Take-up of an  
Unemployment Insurance Reform  
in France**

**A Duration Analysis with Competing and  
Defective Risks**

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# The non take-up of an unemployment insurance reform in France

A duration analysis with competing and defective risks

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## Abstract

On July 2001 a more generous unemployment insurance system was introduced in France. Those who were registered at the national unemployment agency at the moment of the reform could choose between staying in the former system and switching to the new one. This paper deals with the selection problem. To explain non participation, we propose a theoretical stationary job search model with several search channels, endogenous search effort and psychological and time costs associated with the use of the public channel. Because of data availability, we estimate the non take-up rate and identify the staying population using defective duration methods. We find a significant non take-up rate smaller than 10% and evidence of self-selection. Stigma, informational issues and expectation of a short unemployment spell are found to explain non participation.

## Résumé

En juillet 2001 le PARE marque l'introduction d'un système d'assurance chômage plus généreux pour les demandeurs d'emploi. Les chômeurs inscrits à l'ANPE au moment de la réforme pouvaient choisir entre rester sous l'AUD ou passer au PARE. Ce papier se propose d'étudier cette sélection. Pour expliquer une non participation, nous construisons un modèle stationnaire de recherche d'emploi avec plusieurs canaux de recherche, un effort endogène et des coûts en temps et psychologiques associés à l'utilisation du canal public PARE. Compte tenu des données existantes, nous estimons le taux de non recours au PARE et identifions la population de "stayer" par des méthodes d'analyses de durées défectueuses. Nous trouvons un taux de non recours significatif de l'ordre de 10% et des évidences d'auto-sélection. L'existence de stigmatisation, de problèmes d'information et l'anticipation d'un rapide retour à l'emploi permettent d'expliquer la non participation.

**JEL:** C41; J64; J65

**Keywords:** non take-up; active labor market policies; selection; duration models

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# Introduction

On July 2001 the French unemployment insurance system changed radically with the implementation of the *Plan d'Aide au Retour à l'Emploi* system (PARE hereafter): unemployment benefits are no longer decreasing over time and the counseling and assistance provided by the national unemployment agency (*Agence Nationale Pour l'Emploi*, ANPE hereafter) are generalized to the whole unemployed population. Unlike the similar foreign experiments the French reform is inspired from, counseling, job assistance and non decreasing benefits are not combined with any real reinforcement in monitoring or sanctions (at least until 2005). As a result, the new unemployment insurance system seems for the unemployed workers more generous and thus more attractive than the former one.

The workers who were unemployed and recorded as such in ANPE at the moment of the reform had the choice between staying in the former system and switching to the new one<sup>2</sup>. Despite the greater generosity of the new system, one can doubt about a massive PARE enrollment: the radical change in the conception of the unemployment insurance system and the numerous debates the year before the reform about the reinforcement of the sanctions made the implementation of the PARE reform uneasy. Moreover, the reform was more or less attractive according to the labor market past history and the unemployment benefit entitlement of the unemployed workers. Costs associated with participation in a program may explain this seemingly irrational refusal of a social support which may increase income and improve the prospects of leaving unemployment (Moffitt, 1983).

Studies on the take-up of active labor market programs (ALMP hereafter) (Black and al., 2003, Rosholm and al., 2004) are still too scarce in comparison with the policy and evaluation implications of this issue. ALMP are shown to have a positive impact on the participants labor market situation in the short run as well as in the long run (Sianesi, 2003, Crépon and alii, 2005). However, they are very costly. Moreover, the more the job seekers participate actively and the more the content of the program fits in with the needs of the participants, the more ALMP are efficient. One can use the take-up rate of welfare programs as a measure of the conformity between the needs of the targeted population and the supply of welfare support. Hence, the analysis of ALMP take-up may account for a useful tool in the design of ALMP. Furthermore, non take-up can affect the econometric evaluation of ALMP. Indeed in presence of non take-up, participants, the policy is evaluated on, are not representative of the entitled population. This selection

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<sup>2</sup>The people who entered unemployment after July 1<sup>st</sup> 2001 were automatically covered by PARE.

issue may bias the treatment effects estimates. It thus appears important to study the ALMP take-up decision in order to enrich the evaluation of such a policy.

The econometric studies which tackle the non take-up issue mostly concern monetary and mean-tested support (Moffitt, 2002; Currie, 2004; Hernanz and alii, 2004). However, any activity which creates fixed costs, monetary or not, can be studied in a take-up framework (Moffitt, 1983). The focus on monetary support may be due to the facts that the refusal of entering in a ALMP is never observed and that the supply of ALMP is constrained, so that any entitled person cannot participate. Here the 2001 French unemployment insurance system reform presents a crucial interest: because of its implementation it allows us to easily identify the entitled population and to observe this decision to participate in a counseling and job assistance program. By refusing to switch to the PARE, the unemployed worker indeed refuses to benefit from a reinforced support in his job search.

This paper deals with the ALMP take-up decision using the French 2001 unemployment insurance system reform. We focus on the selection problem. We do not evaluate the impact of the new unemployment insurance system on the return to employment with endogenous participation. This would not be possible here as we work on data corresponding to the period of the implementation of the system. During such a period, the composition of the inflow is time-varying so that the treatment effect is not constant.

The purpose of this study is twofold. We develop a theoretical model to explain the decision of the unemployed worker to participate or not in the new insurance system. Entering into a system with job search assistance may improve the exit from unemployment but may also be costly, as it may be stigmatizing and as it constrains the unemployed worker to allocate more time and effort to the formal search channel. To describe this possibly reallocation of job search effort between the informal and the formal search channels, we consider a stationary job search model in partial equilibrium with endogenous search effort and with two search channels, a private one and a public one (Fougère, Pradel and Roger, 2005). The public channel can be with or without counseling and job search assistance. We allow for two types of costs associated with the use of the public channel with assistance (Moffitt, 1983): a variable time cost and a fixed psychological cost. Empirically, we estimate the non take-up rate and characterize the staying population. We use administrative data extracted from ANPE records. Because existing data do not contain any variable directly describing in which system the unemployed workers are, we do not directly observe the selection decision. To deduce the take-up decision, we use the fact

that under the former system no interviews were organized, whereas under the 2001 system, every unemployed worker has to be interviewed. We rely our analysis on the dates of these interviews: we assume that an unemployed worker chose to switch to the new system if he has an interview during his unemployment spell. This strategy to impute the take-up decision may overestimate the non take-up rate, as a taker could have found a job before he got his interview. To correct the estimates from this bias, we implement a competing and defective risks duration model (Maller and al., 1996; Addison and al., 2003).

The estimated non take-up rate accounts for less than 10%. This massive enrollment to the PARE system appears as an *ex post* justification of the orientation taken in the policy dispensed to the unemployed workers and of the financial effort made to fund these ALMP. We identify self-selection: the workers who encounter greater difficulties on the labor market and who have longer unemployment spells are more likely to participate in the new system. They are interviewed faster than the rest of the unemployed population. We find evidence of PARE non take-up due to stigma, informational issues and expectation of a short unemployment spell.

The paper is organized as follows: in section I the 2001 reform is described and the relevance of the concept of PARE non take-up is discussed. In section II, we present the theoretical framework. In section III, we describe the data, the empirical methodology and the descriptive analysis. In section IV, we present the statistical model of competing and defective risks. Section V contains our results and comments.

## 1 The PARE take-up decision

Any unemployment insurance (UI hereafter) system must be designed in order to balance between insurance against job and revenue losses and incentives to an active job search. Several instruments can be used to realize such an arbitrage (Fredriksson and al, 2003): duration, amount and time profile of the unemployment benefits, monitoring and sanctions and workfare. Decreasing benefits insure from revenue losses and act as an indirect sanction to non sufficient search effort without generating particular monitoring costs. ALMP rather aim at improving the exit from unemployment by providing job seekers with counseling and job search support, but also at making unemployment less attractive by creating a "tax on leisure" (Rosholm and al., 2004) through the participation in programs. Monitoring and sanctions are generally added in order to reinforce the incentive aspect of such a system. Since the eighties, systems associating job search assistance and sanctions

have been implemented in most of the OCED countries. Empirical evaluations of ALMP reveal that job search assistance increases the exit rate from unemployment to employment of the beneficiaries (Meyer, 1995). For the French case Crépon and al. (2005) show that the main schemes provided in the PARE system have a positive impact on the return to employment and mostly a negative effect on unemployment recurrence.

France experienced successively two UI systems relying on different instruments to reach both objectives: from 1992 to 2001 the *Allocation Unique Dégressive* (AUD hereafter) used regular decreases in the unemployment benefits<sup>3</sup>. On July 2001, France has then followed foreign experiences and introduced the *Plan d'Aide au Retour à l'Emploi* (PARE hereafter). This reform involved two main changes. First, benefits are no longer decreasing over the unemployment spell: the entitled unemployed workers receive constant benefits over six months or more if the eligibility rights allow for it. Second, an active labor market policy component is introduced. Before the reform, ANPE already provided the unemployed workers with job search assistance. However, most of the time unemployed workers did not meet any ANPE caseworker during their unemployment spell. Moreover, training and subsidized jobs were only dedicated to long-term unemployment. The 2001 reform has generalized such active schemes to the whole unemployed population registered at ANPE. A meeting is now compulsory for every newly registered unemployed worker: any unemployed worker meets a caseworker during about 30 minutes to evaluate his job search ability and to decide the kind of assistance he should receive regarding his needs, his ability and the global and local situation of the labor market. The meeting concludes with the signing of a contract, labeled *Plan d'Action Personnalisé* (PAP), which is actualized every 6 months if the person is still unemployed. The unemployed worker is first oriented toward one of the 4 existing levels of services, that are *free access*, *individualized support*, *reinforced follow up* and *social follow up*. Then he can be proposed 5 kinds of schemes : workshops, skill or project assessments and job-search or project support (Crépon and al, 2005 and Jugnot and al., 2006 for a description of these programs). The unemployed worker can refuse to participate in the proposed program. The particularity of the 2001 French reform, in comparison with similar experiments in other OECD countries, is that counseling, job assistance and non decreasing benefits are not combined with any real reinforcement in sanctions or monitoring (Freyssinet, 2001). As a result, PARE appears to be more attractive than AUD for the unemployed workers.

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<sup>3</sup>Benefits declined by 8%, 15% or 17% every 6 months depending on the type of entitlement

The persons who entered unemployment after July 1<sup>st</sup> 2001 were automatically covered by the PARE system. On the contrary, those who were registered at the public unemployment agency before July 1<sup>st</sup> 2001 and who were still unemployed at this date, switched from AUD to PARE on a voluntary basis<sup>4</sup>. Starting from June 18<sup>th</sup> 2001, they received a form they had to fill and return, indicating whether they accepted PARE or preferred staying in AUD. If PARE was chosen, the unemployed person switched from AUD to PARE: from the start of the month following the receipt of their option form by ANPE, he benefited from the personalized job search assistance and received a non decreasing benefit (over six months or until the end of the entitlement period), which amount was fixed at the level of the benefit received the day before the switching. On the contrary, if the unemployed individual stayed in AUD, his benefit declined until the end of the entitlement period and he could not benefit from the ALMP offered in the new system.

Despite the higher generosity of PARE in comparison with AUD, one can expect to find some unemployed workers who decided to stay under the AUD system. We consider three main explanations for PARE non take-up: the expectation of a rapid return to employment, informational issues and the perception of psychological and time costs associated with evaluation and participation in ALMP.

– *Expectation of a short spell of unemployment*

The non decrease in the benefits is not attractive for the unemployed individuals who expect to exit unemployment before July 1<sup>st</sup> 2001 or before their next decrease in the decreasing benefit, or for the uninsured unemployed workers. Anderson and Meyer (1997) use a special Current Population Survey supplement administered in 1989 and 1990 and report that 37% of the unemployed workers, who believe they are entitled and do not apply for unemployment insurance, indicate that they do not apply because they expect to get another job soon or to be recalled. Likewise, a report (Commissariat Général au Plan 2000) states that more than a third of the entitled people who do not apply for the minimum resources benefit think they would soon find a job. Furthermore, the prospect to find a job soon makes participation in an unemployment insurance system with counsel and assistance less attractive or undesirable, except for those who are willing to obtain another job than the one they are preparing to take: notifications and meetings with ANPE caseworkers are indeed in this case time costly and act as a "tax on leisure".

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<sup>4</sup>Except for some particular cases, that are job search exempted, beneficiaries of unemployment benefit aged of 59 years and a half or more, beneficiaries in total unemployment without contract breach, beneficiaries entitled for a 4 month benefit and handicapped workers of protected workshops.

– *Informational issues*

Although ANPE sent a note of explanation to the unemployed workers concerned by the choice, the importance and multiplicity of the change may have damaged the legibility of the reform. Before the final decision, there was an important debate on the definition of "acceptable" jobs and on the extent of sanctions (Freyssinet, 2001), so that unemployed workers could doubt the fact that there would not be any reinforcement in monitoring or sanctions. In particular, doubts could remain about the real motivation behind the compulsory interviews. These interviews organized every 6 months are actually used to reevaluate and adapt the personalized support: among the unemployed workers who signed a PAP contract in 2002, 42% were oriented in the free access service following the first interview. Among them, 56% received an update interview. Following this second interview, 2/3 of the considered unemployed workers were reoriented in a higher level of assistance and the remaining third remained in the free access level (Jugnot and alii., 2006). However, the update interviews could be perceived by the unemployed workers as a monitoring instrument. As a result, the unemployed workers could understand the choice they were given on July 2001 as a choice between, on the one hand a certain decrease in the amount of the benefits and, on the other hand keeping constant benefits over 6 months but experiencing a risk of a benefit suppression at the end of this period. Thus informational issues are linked with a risk dimension. Elsewhere, giving the people the choice merely let think that the reform is not entirely profitable.

– *Stigma and private job search methods*

The disutility arising from unemployment experience is due to psychological features just as well as income losses (Clark, 2003). Setting about procedures required to benefit from the UI services assumes that the job seeker acknowledges his new situation and expects it to last or feels that he will need support to find another job<sup>5</sup>. The unemployed workers concerned by the PARE take-up decision are already registered, so that they already have accepted to benefit from the support of ANPE. Hence, they should have gone beyond this psychological cost. Now, we wonder whether these unemployed workers agree with the reform. The fact that an unemployed worker decided to register during the AUD legislation does not necessarily involve that he would have done the same if the ongoing system at the moment of his job loss were PARE. Studies on welfare program participation indeed reveals that the more visible the assistance is, the lower the take-up

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<sup>5</sup>The unemployed workers entitled to unemployment benefits do not receive their benefit immediately after registration, but after a waiting period which lasts at least a week and at the most 75 days



rate is (Currie, 2004), and ANPE support may be considered as more "visible" within PARE than within AUD because of the new active component and the more frequent contacts with ANPE, the introduction of compulsory six-monthly interviews induced.

Job assistance and counseling might be more or less useful depending on the degree of difficulties encountered on the labor market. Crépon and al. (2005) indeed reveal that 83% of their sample do not participate to any of 4 main PAP schemes they study. Jugnot and ali.(2006) also show that from 2002 to 2004, 43% of the unemployed workers were oriented to the level of minimum assistance following their first interview. Some individuals may prefer getting a new job on their own and thus staying in AUD: job seekers who have a social network or who do not highly value the public channel, either because they challenge ANPE efficiency or think ANPE services are not adapted to their needs, may prefer staying under the AUD system. Job search *via* the public channel is indeed more restricting and time demanding within PARE than within AUD, such that time available to the private or informal job search is smaller in PARE than in AUD.

Furthermore, some individuals may be reluctant to be evaluated or to benefit from ALMP. Studies have indeed revealed strategic behavior from some unemployed workers concerning ALMP participation: Anderson and Meyer (1997) report that 6% of those who do not apply the unemployment insurance, although they are entitled to it, do not apply because they consider unemployment insurance being too much like charity/welfare. Besley and al. (1992) explain that some workfare programs where one ought to actively search a job to receive benefits could bring some entitled people not to apply. Black and al. (2003) evaluate in Kentucky the impact of a program where unemployed workers exposed to long spells of unemployment are proposed schemes which are similar with those proposed in PARE<sup>6</sup>. An important part of the positive effect of this program comes from the fact that many individuals exit unemployment following the mere receipt of a notification indicating they are to participate in a ALMP. Rosholm and Svaer (2005) also identify in Denmark such a "threat effect" of ALMP: the return to employment increases when people get closer to the period during which participation in a ALMP becomes compulsory. In France, Jugnot and al. (2006) reveal that those who encounter greater difficulties on the labor market are those who are the more likely to participate in the scheme they were proposed following the PAP interview: the realization rate is higher for uninsured unemployed workers and beneficiaries from means-tested welfare support than for the rest of the unemployed population.

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<sup>6</sup>The major difference between this Worker Profiling and Reemployment Services and PARE is that in the former system participation is compulsory once the scheme is proposed to the unemployed worker.

## 2 Theoretical framework

### 2.1 General framework and assumptions

In this section we aim at formalizing these intuitions in a job search model close to the one developed by Fougère and ali (2005). Despite the fact that welfare program participation has important intertemporal consequences on human capital and job search, such an issue is generally studied in a non dynamic setting (Currie, 2004 and Moffitt, 2002)<sup>7</sup>. Here it appears important to focus on the lasting consequences a PARE participation may have on the unemployment duration and value and on job opportunities. PARE participation means indeed entering into an UI system which explicitly aims at increasing the participants' ability and human capital to improve their future wages and the quality of their future jobs. The starting point of our model is that such considerations guide the unemployed workers in their choice (Heckman and al., 1999): individuals make their take-up decision by comparing the expected utility they have under each UI system. The final decision results from an offset between the increase in job opportunities and the payment of a PARE participation cost. We show that the unemployed worker stays in AUD if the PARE participation cost exceeds a threshold value that we define.

We assume that individuals decide whether to take up PARE or not at the receipt of the option form, i.e. on June or July 2001. We rule out the situation in which an unemployed worker stays in AUD a few weeks before sending back his option form. This convenient assumption allows us to work in a stationary setting. Moreover it does not seem too restrictive as the financial advantages of PARE in comparison with AUD make temporary non take-up unlikely.

Our framework is a stationary job search model in partial equilibrium with endogenous search effort and three search channels. We are in continuous time and do not allow for on-the-job search. The three search channels are: a public one without job search assistance (AUD), a public one with job search assistance (PARE) and a private one. The public channels are denoted 0 and the private one is denoted 1. Whichever the UI system, any individual can use two job search channels, a public one, which is either with or without job search assistance, depending on whether they are in PARE or AUD, and the private one<sup>8</sup>. Individuals have a discount rate  $\rho$ . When in AUD (resp. PARE), an unemployed worker receives at each period of time an amount of benefit equals to  $b$  (resp.  $b'$ ) ( $b$  and

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<sup>7</sup>We just found one dynamic model of welfare participation in the literature (Fang and al., 2006)

<sup>8</sup>Our study deals with unemployed workers registered at ANPE so that the use of the public channel is compulsory. We assume for convenient purpose that every individual knows at least one person who can inform him about vacant jobs

$b'$  are null for an uninsured individual). We consider that at each period of time the insured individual receives a constant part of the actualized flow of benefits he would receive during his entitlement period. Hence, we take into account the change in benefits the reform induced, but do not model the decrease in the AUD benefits. For simplicity concerns, we omit the question of entitlement rights lapsing. To rationalize PARE non take-up we allow job search through the PARE public channel to be costly. Using the AUD public channel is on the contrary assumed not costly for identification purpose. After the fashion of Moffitt (1983), we define two components in this cost - a fixed and a variable component. The fixed cost is the psychological cost due to the mere evaluation and participation in an UI system with personalized follow-up: when in PARE, the individual experiences at each period of time a fixed strictly positive disutility, denoted  $\phi$ , which is randomly drawn from a continuous c.d.f.  $G$  with support  $(0, +\infty)$ . This term introduces heterogeneity in the model. The variable cost may be understood as a time cost and is introduced through the private search effort cost function. The amount of this cost is more or less important depending on the number and duration of the proposed schemes. It may also depend on the job search strategy of the unemployed worker. The underlying idea is that the unemployed worker has to devote more time and effort in the job search through the public channel if he is in PARE than if he is in AUD. Elsewhere, the PARE reform aimed at increasing the public channel efficiency. As the public channel becomes more efficient, job seekers may decide to participate in PARE and to devote more time using the public channel. Thus entering into PARE may increase the opportunity cost of the private channel, and induce a reallocation of the job search effort between the public and the private channels. Let  $c_{AUD}(s)$  and  $c_{PARE}(s)$  be the costs for using the private channel with a search effort  $s$  when the worker is respectively in AUD and in PARE.  $c_{AUD}(\cdot)$  and  $c_{PARE}(\cdot)$  are positive, convex, increasing functions of  $s$ . To introduce this possible "leisure tax effect", we allow  $c_{PARE}(\cdot)$  to have a higher curvature than  $c_{AUD}(\cdot)$ . Thus for  $R = \{AUD, PARE\}$ ,  $c_R(s) \geq 0$  and  $c'_R(s) > 0 \forall s \geq 0$ ,  $c_R(0) = c'_R(0) = 0$  and  $c''_{PARE}(s) \geq c''_{AUD}(s) > 0 \forall s > 0$ .

To reflect the possible higher efficiency of the public search channel in PARE than in AUD, we impose assumptions on job arrival rates and destruction rates: within AUD, the unemployed worker receives job offers from ANPE with a Poisson process of intensity  $\lambda_0$ . The job offer arrival rate within PARE equals  $0 \leq \lambda_0 + \lambda'_0 \leq 1$  with  $\lambda'_0 \geq 0$ . Elsewhere, whichever system covers him, the unemployed worker receives job offers through the private channel with a Poisson process of intensity which equals the private job search effort  $s$ . The

total arrival rate of job offers is thus equal to  $\lambda_0 + s$  if the worker is in AUD, and  $\lambda_0 + \lambda'_0 + s$  if he is in PARE<sup>9</sup>. A job offer is associated with a channel-specific constant separation rate. If the job is obtained through the private channel, it is destroyed with intensity  $0 < \sigma_1 < 1$ , whichever the system that covers the individual. To take into account the fact that the unemployment insurance system with job search assistance allows for better employee-employer matches (Crépon and ali, 2005), we assume that the separation rate is higher for jobs obtained through the AUD public channel than for those who are obtained through the PARE public channel: the separation rate equals  $\sigma_0$  within AUD and  $\sigma_0 - \sigma'_0$  within PARE, where  $0 < \sigma_0 < 1$  and  $0 < \sigma_0 - \sigma'_0 < 1$ . Moreover we assume that  $\sigma_0 < \sigma_1$ . A job offer is also associated with a constant wage rate, denoted  $\omega$ . It is drawn from the continuous function  $F_0$  (resp.  $F_1$ ) if the offer is obtained through the public (resp. private) channel.

## 2.2 The model

We now define the expected value of an AUD unemployment spell, denoted  $V^{AUD}$ , and the expected value of a PARE unemployment spell, denoted  $V^{PARE}$ . We also define  $W_i^R$ , the expected value of the employment spell which begins when the individual accepts the job offer he obtained through the  $j$ -th channel ( $j=0$  or  $1$ ) when he was in the  $R$ -th UI system ( $R=\{\text{AUD}, \text{PARE}\}$ ).

Following our assumptions on wage distributions and destruction rates, the value function of the employment spell depends on the job search channel used to find the job and on the unemployment insurance system from which the individual exits.

The value function of employment when an unemployed worker is in an AUD unemployment spell and accepts a job obtained through the  $i$ -th channel is (where  $i = 0, 1$ ):

$$\rho W_i^{AUD}(\omega) = \omega + \sigma_i(V^{PARE} - W_i^{AUD}(\omega)) \quad (2.1)$$

and the value functions of employment following a PARE unemployment spell are:

$$\rho W_0^{PARE}(\omega) = \omega + (\sigma_0 - \sigma'_0)(V^{PARE} - W_0^{PARE}(\omega)) \quad (2.2)$$

$$\rho W_1^{PARE}(\omega) = \omega + \sigma_1(V^{PARE} - W_1^{PARE}(\omega)) \quad (2.3)$$

When employed, the individual receives an instantaneous wage  $\omega$ . Jobs obtained through the private channel are destroyed with intensity  $\sigma_1$ . Jobs obtained through the AUD (resp. PARE) public channel are destroyed with intensity  $\sigma_0$  (resp.  $\sigma_0 - \sigma'_0$ ). If the job is destroyed,

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<sup>9</sup>we assume that at each period, the unemployed worker receive at most only one offer.

the worker systematically enters in a PARE unemployment spell: we consider individuals who are registered at ANPE on July 2001, so that the obtained job can only be destroyed after July 1<sup>st</sup> 2001, i.e. after the reform. It is the reason why the utility obtained in case of separation is  $V^{PARE}$ .

When covered by AUD, the unemployed worker receives benefits  $b$  (possibly null if the individual is uninsured) and pays a private search effort cost  $c_{AUD}(s)$  if he expends a search effort  $s$  using the private channel. The unemployed worker receives a job offer from ANPE (resp. from his social network) with probability  $\lambda_0$  (resp.  $s$ ). The job offer is associated with a wage  $\omega$  drawn from distribution  $F_0$  (resp.  $F_1$ ). The expected value of an AUD unemployment spell is thus:

$$\begin{aligned} \rho V^{AUD} = b - c_{AUD}(s) &+ \lambda_0 E_{F_0} \left[ \max(0, W_0^{AUD}(x) - V^{AUD}) \right] \\ &+ s E_{F_1} \left[ \max(0, W_1^{AUD}(x) - V^{AUD}) \right] \end{aligned} \quad (2.4)$$

The crucial assumption is that in PARE, using the public channel may be costly. There are a constant fixed cost  $\phi \geq 0$  and a variable cost which modifies the private search effort cost function. The additional term  $\lambda'_0$  associated with the AUD public job arrival intensity  $\lambda_0$  reflects that PARE participation makes the public channel more efficient. Thus:

$$\begin{aligned} \rho V^{PARE} = (b' - \phi - c_{PARE}(s)) &+ (\lambda_0 + \lambda'_0) E_{F_1} \left[ \max(0, W_0^{PARE}(x) - V^{PARE}) \right] \\ &+ s E_{F_0} \left[ \max(0, W_1^{PARE}(x) - V^{PARE}) \right] \end{aligned} \quad (2.5)$$

The unemployed worker participates in the PARE system if and only if the expected utility of the PARE unemployment spell is higher than the expected utility of the AUD unemployment spell, i.e. if and only if:

$$P = \begin{cases} 0 & \text{if } V^{PARE} \leq V^{AUD} \\ 1 & \text{if } V^{PARE} > V^{AUD} \end{cases}$$

### 2.3 Determination of the rule of participation

We first determine the optimal reservation wages and the optimal private job search efforts respectively in AUD and PARE unemployment spells. We then determine the threshold value of  $\phi$  underneath which  $V^{PARE} > V^{AUD}$ .

Let  $\omega_i^{AUD*}$  (resp.  $\omega_i^{PARE*}$ ) be the reservation wage for offers obtained through the  $i$ -th channel ( $i = 0, 1$ ) when the individual is in a AUD (resp. PARE) unemployment spell.

The reservation wage is the wage that makes the unemployed worker indifferent between staying unemployed and accepting the job offer. According to this definition we have :

$$\omega_i^{AUD*} = (\rho + \sigma_i)V^{AUD} - \sigma_i V^{PARE} \quad \text{for } i = 0, 1 \quad (2.6)$$

and

$$\omega_0^{PARE*} = \omega_1^{PARE*} = \rho V^{PARE} \quad (2.7)$$

(2.4) and (2.6) give:

$$\rho V^{AUD} = (b - c_{AUD}(s)) + \frac{\lambda_0}{\rho + \sigma_0} H_0(\omega_0^{AUD*}) + \frac{s}{\rho + \sigma_1} H_1(\omega_1^{AUD*}) \quad (2.8)$$

where

$$H_i(\omega_i^{AUD*}) = \int_{\omega_i^{AUD*}}^{\infty} (x - \omega_i^{AUD*}) dF_i(x) \quad \text{for } i = 0, 1$$

The same, (2.5) and (2.7) give:

$$\omega^{PARE*} = (b' - \phi - c_{PARE}(s)) + \frac{\lambda_0 + \lambda'_0}{\rho + \sigma_0 - \sigma'_0} H_0(\omega^{PARE*}) + \frac{s}{\rho + \sigma_1} H_1(\omega^{PARE*}) \quad (2.9)$$

where

$$H_i(\omega^{PARE*}) = \int_{\omega^{PARE*}}^{\infty} (x - \omega^{PARE*}) dF_i(x) \quad \text{for } i = 0, 1$$

Equation (2.9) defines an implicit relation  $\psi(s, \omega^{PARE*})=0$  between  $s$  and  $\omega^{PARE*}$ . By the implicit function theorem, we get

$$\frac{\partial V^{PARE}}{\partial \phi} = - \left[ \rho \left( 1 + \frac{\lambda_0 + \lambda'_0}{\rho + \sigma_0 - \sigma'_0} (1 - F_0(\omega^{PARE*})) \right) + \frac{s}{\rho + \sigma_1} (1 - F_0(\omega^{PARE*})) \right]^{-1} < 0$$

The higher the PARE participation cost is, the lower the value of being in a PARE unemployment spell is. Thus, there exists a threshold value  $\underline{\phi}$  for PARE participation. We have  $V^{AUD} > V^{PARE}$  if and only if the fixed participation cost is higher than the threshold value  $\underline{\phi}$ . To determine the value of  $\underline{\phi}$  we set the utility level where the individual is indifferent between taking up PARE and staying in AUD. We get<sup>10</sup>:

$$\begin{aligned} \underline{\phi} = (b' - b) - c_{PARE}(s^{PARE*}) + c_{AUD}(s^{AUD*}) + \frac{(\rho + \sigma_0)\lambda'_0 + \sigma'_0\lambda_0}{(\rho + \sigma_0)(\rho + \sigma_0 - \sigma'_0)} \lambda_0 H_0(\omega^{PARE*}) \\ + \frac{s^{PARE*} - s^{AUD*}}{\rho + \sigma_1} H_1(\omega^{PARE*}) \end{aligned}$$

where  $s^{AUD*}$  and  $s^{PARE*}$  are the result of UI system specific optimisation programs:

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<sup>10</sup>we use the fact that if  $V^{PARE} = V^{AUD}$ , then  $\omega_0^{AUD*} = \omega_1^{AUD*} = \omega^{PARE*}$

If the individual uses the private channel when he is in a  $R$  unemployment spell, for  $R = \{AUD, PARE\}$ , he chooses his effort intensity to maximize his  $R$  expected utility<sup>11</sup>. Under the assumption that the inverse of  $c'_R$ ,  $(c'_R)^{-1}$  exists, we have:

$$s^{AUD*} = c'_{AUD}{}^{-1} \left[ \frac{1}{\rho + \sigma_1} H_1(\omega_1^{AUD*}) \right] \quad \text{and} \quad s^{PARE*} = c'_{PARE}{}^{-1} \left[ \frac{1}{\rho + \sigma_1} H_1(\omega_1^{PARE*}) \right]$$

## 2.4 Comparative statics

To go further, we have to set parametric specification on the cost functions. By setting  $c_{AUD}(s) = \gamma s^2$  and  $c_{PARE}(s) = (\gamma + \gamma') s^2$  with  $\gamma > 0$  and  $\gamma' \geq 0$ , we get:

$$s^{PARE*} = \frac{1}{2(\gamma + \gamma')(\rho + \sigma_1)} H_1(\omega_1^{PARE*}) \quad \text{and} \quad s^{AUD*} = \frac{1}{2\gamma(\rho + \sigma_1)} H_1(\omega_1^{AUD*})$$

We then get that  $s^{PARE*} < s^{AUD*} \Leftrightarrow V^{AUD} < V^{PARE}$ : when the unemployed worker enters into PARE, he reduces his optimal private search effort.

The threshold value below which the individual takes up PARE then becomes:

$$\underline{\phi} = (b' - b) + \frac{(\rho + \sigma_0)\lambda'_0 + \sigma'_0\lambda_0}{(\rho + \sigma_0)(\rho + \sigma_0 - \sigma'_0)} H_0(\omega^{PARE*}) - \frac{\gamma'}{4\gamma(\gamma + \gamma')(\rho + \sigma_1)^2} [H_1(\omega^{PARE*})]^2$$

The more the PARE reform creates financial gain and/or improves the stability of the jobs obtained through the public channel or the public-channel job offer arrival rate, the higher the probability to take up PARE is:

$$\frac{\partial \underline{\phi}}{\partial (b' - b)} = 1 > 0,$$

$$\frac{\partial \underline{\phi}}{\partial \sigma'_0} = \frac{\lambda_0 + \lambda'_0}{(\rho + \sigma_0 - \sigma'_0)^2} H_0(\omega^{AUD*}) > 0 \quad \text{and} \quad \frac{\partial \underline{\phi}}{\partial \lambda'_0} = \frac{1}{(\rho + \sigma_0 - \sigma'_0)} H_0(\omega^{AUD*}) > 0$$

On the contrary, the higher the private search cost is when the individual is in the PARE system, the lower the probability to take up PARE is:

$$\frac{\partial \underline{\phi}}{\partial \gamma'} = -\frac{\gamma^2}{\gamma'(\gamma + \gamma')^2(\rho + \sigma_1)^2} [H_1(\omega^{AUD*})]^2 < 0$$

In the following sections, we introduce and estimate an econometric model to evaluate the empirical validity of these theoretical predictions on PARE non-takeup.

<sup>11</sup>If the individual does not use the private channel when he is in the AUD system, he will not use it neither in a PARE unemployment spell: in the PARE system, the use of the private channel is more costly but is not more efficient. This directly comes from the assumptions set on the cost functions

## 3 Empirical analysis

### 3.1 Data

We use longitudinal data extracted from ANPE records. We use a 1/12 nationally representative sample of all unemployed workers<sup>12</sup>. These data contain numerous individual socio-demographic and unemployment characteristics back to the first registration in ANPE. The sample is followed up to December 31<sup>st</sup> 2005. Information concerning the unemployment spells are reported on a daily basis. Data on benefits are not easily exploitable because the classification in the data is complex, does not fit in with the classification used by the agency in charge of unemployment benefits (ASSEDIC-UNEDIC) and is not enough detailed (in particular, the amount of the benefits received by the unemployed are not given). We only use these information to determine whether the unemployed worker receives unemployment benefits in July 1<sup>st</sup> 2001 and at the moment of the exit from unemployment. We match this data set with another file provided by ANPE which contains the dates of the PARE compulsory interviews, describes the PAP schemes offered by ANPE and indicates whether the unemployed worker participates in it.

We select the unemployed workers who are concerned by the choice of the unemployment system, i.e. the people who experienced an unemployment spell starting before and ending after July 1<sup>st</sup> 2001. To take into account the few particular categories of unemployed which automatically switched to the PARE even if they were in the stock of the end of June 2001, we also drop the handicapped workers (7,2% of the stock) and the unemployed aged of 59 years and half or more on July 2001 (0,4% of the stock)<sup>13</sup>. 258 660 unemployed persons satisfied these criterion and thus constitute the sample of interest. The following descriptive and econometric analysis is realized on this selected sample.

### 3.2 Identification of the take-up decision:

These data do not allow us to determine precisely and directly whether the unemployed worker chose to stay in the previous system or decided to move to the new one: there is no variable in the data set describing the system covering the unemployed workers. The only way we have to deduce the decision taken by the unemployed worker is to check whether the unemployed worker had, during the relevant spell, at least one PAP interview, which is compulsory within PARE, but does not exist within AUD. Let  $P_i^*$  be the decision of the

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<sup>12</sup>Only the unemployed people born in Mars of the odd years and in October of the even years are preserved in the sample. We restrict the analysis to the metropolitan France.

<sup>13</sup>The data do not allow us to detect the other unemployed types who are exempted from the choice of regime



unemployed worker  $i$  and  $P_i$  be the observed choice. Our observational scheme is  $P_i = 1$  only if  $P_i^* = 1$ .

This indirect method to deduce the value taken by the variable of interest raises some problems. When PARE was implemented in July 2001, the priority for the interviews was given to the newly registered. Although the workers who became unemployed after July 1<sup>st</sup> 2001 were interviewed in the month of their record, those who switched were called later, progressively to lighten the burden of ANPE. We do not know when the unemployment agency had finished interviewing all the persons who switched from AUD to PARE. Moreover, the 2001 reform took place during an important increase in unemployment, which caused serious problems in the practical implementation of the interviews and involved delays in the notification of the switching unemployed workers (Rapport thématique de la Cour des Comptes, 2006). As a result, only 54% of the individuals who got a PAP interview had it within the 6 months following July 1<sup>st</sup> 2001 (Figure 1). It is thus possible that an unemployed worker who chose the PARE left unemployment before he was interviewed. If so, the person is incorrectly considered as having stayed in AUD. Hence, without econometric methods able to take this censoring into account, this misclassification issue would lead us to overestimate the non take-up rate. We thus implement econometric methods which focus on the timing of event, i.e. duration analysis methods.

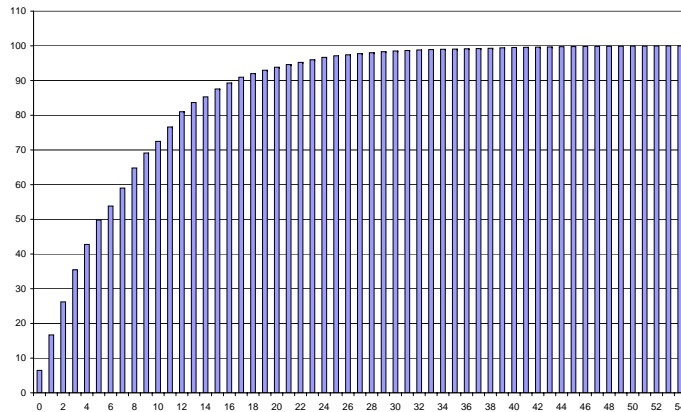


FIG. 1 – Distribution of the duration from July 1<sup>st</sup> 2001 up to the first PAP interview among the unemployed workers who got an interview (cumulative %)

### 3.3 Descriptive Analysis

#### 3.3.1 Non parametric estimates of the PARE non take-up rate:

If we ignore the censoring bias and merely look at the proportion of unemployed workers who have a PAP interview during their unemployed spell, we find a PARE non take-up

rate of 55,9%. To correct this figure for the censoring bias, that is to take into account that an exit from unemployment could have occurred before the switching unemployed person was notified for the interview, we produce the Kaplan-Meier estimates of the survival function of the duration from July 1<sup>st</sup> 2001 up to the date of the first PAP interview (Figure 2). We consider that this duration can be independently right-censored by an exit from unemployment<sup>14</sup>. Presence of non take-up is revealed by the convergence of the survival function to a positive non null value at infinite: at the end of the observation period a non null proportion of individuals did not have any interview but were still unemployed.  $\hat{S}_n(t_{(n)})$  is the value of the Kaplan-Meier estimate taken at the greatest duration observed in the sample (censored or not)  $t_{(n)}$ . In our case,  $t_{(n)} = 1644$  corresponds to a censored observation. There are in the sample individuals who do non take-up if and only if  $p = S(\infty) > 0$ . Here  $p$  is the proportion of unemployed workers who will never have any PAP interview in their spell of unemployment. Under the assumption of a model of i.i.d. censoring,  $\hat{S}_n(t_{(n)})$  is a consistent estimator of  $p$  (Maller and Zhou, 1996). To state with certainty that a proportion of the population will always be at risk, we need an observation period long enough (Maller and Zhou, 1996). We can reasonably think that this necessity is fulfilled as we observe the individuals up to 54 months, i.e. 4 years and a half after July 1<sup>st</sup> 2001. This propriety of sufficient follow-up is crucial in the sense that it assures that  $\hat{S}_n(t_{(n)})$  is an unbiased asymptotic estimator of  $p$ .  $\hat{S}_n(t_{(n)}) = 0,0578$  is significantly different from 0 at 1%. Thus we non parametrically estimate a non take-up rate of about 6%.

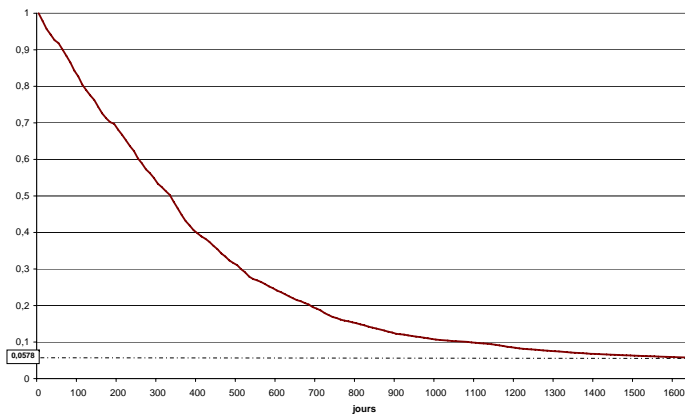


FIG. 2 – Kaplan-Meier estimate of the survival function of the duration up to the first PAP interview

<sup>14</sup>An independent censoring means here that the instantaneous probability to have an interview is the same one among the censored and the not censored individuals

### 3.3.2 Determinants of the decision to participate in the PARE system

If we merely compare the composition of the subpopulation of the stock at the end of June 2001 who has a PAP interview with the one who has none (Appendix A), a self selection into the new system is noticeable: those who encounter greater difficulties on the labor market seems to be more likely than others to switch to the PARE. These descriptive results are confirmed by the stratified Kaplan-Meier estimates (Appendix B). We stratified the estimate of the survival function of the duration up to the first PAP interview according to gender, diploma, qualification, assistance benefit receipt, unemployment allocation entitlement status and time elapsed at ANPE prior July 1<sup>st</sup> 2001. Rank tests always reject the null hypothesis of homogeneity of the respective strata.

There are small differences according to sociodemographic characteristics (Appendix A.1): the subpopulation which has a PAP interview is more feminized and is overall older than the subpopulation for which no PAP interview is reported in the data. Moreover, the distribution of educational levels is low-shifted in the population with PAP interview in comparison with the other considered subgroup: the proportion of individuals who obtained at least a secondary level is higher among those who have not any PAP interview than among those who got a PAP interview. The stratified Kaplan-Meier estimates confirm that men are more likely than women to non take-up PARE and that the non take-up rate increases with the level of diploma (Table 1 and Appendix B).

	$\hat{S}_n(t_{(n)})$
<b>gender</b>	
male	8,4%
female	3,3%
<b>diploma</b>	
none	3,5%
< secondary	4,4%
secondary	8,7%
> secondary	10,2%

TAB. 1 – Non parametric estimates of non take-up rates by sociodemographic strata

Differences between the two subgroups of interest are also marked according to labor market past history and attributes of the ongoing unemployment spell on July 2001 (Table 2 and Appendix A.2): the proportion of workers entered into unemployment because of lay off or term of conversion contract is higher in the subgroup with PAP interview than in the other one. On the contrary, workers who have a job but are registered at ANPE because

they are seeking another job and those who are seeking their first job are less represented in the subgroup with a PAP interview than in the population without any PAP interview. The degree of availability of the unemployed worker also matters: the proportion of job seekers who declare to be not available to work immediately is higher among those who have not any interview. The subpopulation with a PAP interview has been on average registered at ANPE for a longer time than the other population (20 months elapsed on average since registration up to July 2001 in the former group and only 15 months and a half elapsed on average for the latter). The proportion of insured unemployed workers on July 2001 is higher among those who got an interview than among those who do not have any interview: 69% of the unemployed workers who got a PAP interview are insured on July 2001, although 54% of those who have none interview are so. This reflect the financial interest of the PARE reform which is effective for the sole insured unemployed workers. At last but not least, the proportion of beneficiaries of the minimum guaranteed income (*Revenu Minimum d'Insertion*, RMI) is higher in the population with PAP interview, although the highly qualified (white collars) are less represented in the population with interview than in the other group. These results run along with the hypothesis of a psychological cost associated with participation in ALMP.

The Kaplan-Meier estimates confirm all these descriptive results, except for the unemployment benefit entitlement status and the length of the unemployment spell:  $\hat{S}_n(t_{(n)})$  increases with the number of elapsed months since registration. This may reflect the decrease in the financial interest of the reform with the time elapsed in the unemployment spell: the unemployed workers who are registered at ANPE for a long time have on average smaller amount of unemployment benefits because they experienced an important number of decrease in their benefits.

Elsewhere, the proportion of crossing off because of non presentation following a monitoring notification is the lowest for the unemployed workers who had the choice between AUD and PARE and chose to switch to the PARE system: only 24% of those who had the choice and got a PAP interview have been crossed off because of non presentation following a monitoring notification. This proportion reaches 34% among the unemployed workers registered at ANPE after July 1<sup>st</sup> 2001, i.e. among those who entered systematically into PARE. These two frequencies are obtained for different periods and populations, so that comparison should be made carefully. However, it may suggest that the unemployed workers who took up PARE are those who were willing to benefit from job search assistance and who had accepted to receive several notifications.

	$\hat{S}_n(t_{(n)})$
<b>receipt of RMI</b>	
no	6,3%
yes	2,2%
<b>qualification</b>	
white collar	6,6%
blue collar	5,7%
<b>insured on July 1<sup>st</sup> 2001</b>	
no	3,4%
yes	6,2%
<b>elapsed duration of the unemployment spell up to July 1<sup>st</sup> 2001</b>	
< 3 months	2,6%
between 3 and 6 months	3,4%
between 6 and 12 months	4,0%
> 12 months	7,3%

TAB. 2 – Non parametric estimates of non take-up rates by professional characteristics

## 4 Statistical model

### 4.1 A model of competing and defective risks

To model the decision to participate in the new unemployment insurance system, we implement a statistical model of competing and defective risks (Melkersson, 1999; Addison and al., 2003). This model allows us to take into account (i) that a AUD unemployment spell can end for different reasons, among which return to employment and switching to a PARE unemployment spell, (ii) that some exits, in our case the PARE unemployment, can be disregarded by some unemployed workers, and (iii) that the employment and PARE unemployment risks may not be independent. This model is thus a competing dependent risks framework augmented with a selection equation to take into account that some unemployed workers are not at risk for the PARE unemployment destination state: some unemployed workers would never be observed transiting to PARE unemployment (i.e. getting a PAP interview) because they did not switch to the PARE system on July 2001, i.e. because they have neglected the PARE destination state.

To model this phenomenon, we could either take a defective distribution for the latent PARE specific duration, or use a "split-population model" (Addison and al., 2003; Schmidt et Witte, 1989). In the former model, notification date is a random process and infinite latent PARE unemployment durations result from successive bad draws. In the latter model, the sample population is divided into two subgroups that are *PARE movers*

and *AUD stayers* in relation to their probability to exit to a PARE unemployment spell. We retained the second modeling as it is more economically intuitive and better fits in with our particular issue. We allow defectiveness for the PARE unemployment risk only. Unemployed workers are PARE movers or stayers according to the time and psychological costs they would suffer if they were to participate in a ALMP.

All the unemployed workers in the sample are in a AUD unemployment spell. We allow for two destination states: (1) PARE unemployment and (2) employment. Individuals exit to PARE unemployment at the date of their first PAP interview. This choice is imposed upon us by the data and does not reflect reality as non declining benefits are perceived starting from the month following the return of the option form. The available data do not allow us to be more precise, but this choice is legitimated by the fact that it is the interview which marks the entry into an UI system with counseling and job search assistance. July 1<sup>st</sup> 2001 is stated as date 0 for the duration to the first PAP interview and the date of registration in ANPE is the initial date for the unemployment duration to any other exit.

Let define 2 latent destination-specific durations  $U_k$ ,  $k = 1, 2$  (see Lancaster, 1990 and Van den Berg, 2001 for a detailed presentation of competing risks models). Those processes correspond to the duration required to exit from AUD unemployment to state  $k$ . The observed transition is the one associated with the shortest latent duration starting from July 1<sup>st</sup> 2001. The duration of the AUD spell is given by the shortest value taken by the latent variables  $U_k$ ,  $k = 1, 2$ , with  $U_k = \tau_k - T_0$  where  $\tau_k$  is the date of exit to state  $k$  and  $T_0$  is July 1<sup>st</sup> 2001. For example, consider an unemployed worker who enters unemployment at  $\tau_0$ . He can exit AUD unemployment to enter into either PARE unemployment or employment, events that in absence of competing risks would respectively occur at  $\tau_1$  and  $\tau_2$ . If the two latent processes are as represented on the left side (resp. right side) of Figure 3, then the observed transition is a transition from AUD unemployment to PARE unemployment (resp. employment).

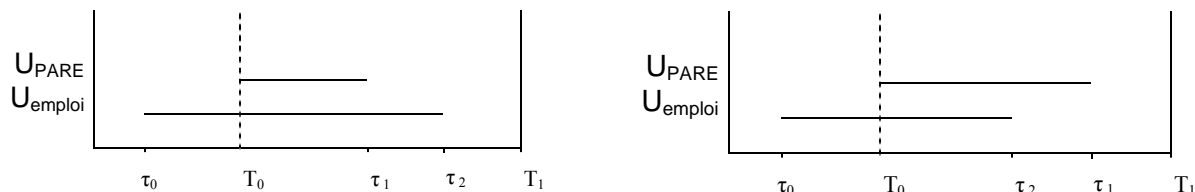


FIG. 3 – Examples

State-specific durations are assumed to be governed by intensity functions of the mixed proportional hazard form (van den Berg, 2001): the transition intensity to state  $k$  after an elapsed duration  $u$  in AUD is defined by :

$$h_k(u|\beta_k, X, \nu_k) = h_k^{(0)}(u) \exp [X'\beta_k] \mu_k$$

where :

$h_k(\cdot)$  is the baseline hazard function which depends on the destination state;

$X$  is a vector of time-invariant covariates. The value taken by  $X$  is fixed at the beginning of the considered spell of unemployment.  $\beta_k$  is the vector of parameters which measures the impact of individual attributes and of the local labor market situation on the AUD unemployment duration elapsed before an exit to state  $k$ ;

$\mu_k = \exp(\nu_k)$  is a positive random variable with repartition function  $F_k$  which specification depends on the destination state  $k$ . This variable is supposed to capture the unobserved individual heterogeneity effect on the transition to state  $k$ : an unemployed worker who would experience an important psychological cost when participating in PARE would have a  $\mu_1$  close to 0. We allow for correlation between destination states through a correlation in  $\nu_1$  and  $\nu_2$ .

We treat as censored a AUD unemployment spell which is not terminated at the end of the observation period (December 31<sup>st</sup> 2001) or which ends because of a transition out of the labor force or because of crossing off. These motivations for the end of the AUD unemployment spell are not homogeneous and are not at the center of our interest<sup>15</sup> (Appendix C - table 5).

If the unemployed worker  $i$  has a PAP interview, his contribution to the likelihood is the very same as in a classical competing risks model: it is the conditional density function of the elapsed duration in the AUD unemployment state starting from July 1<sup>st</sup> 2001, given

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<sup>15</sup>There is no consensus on the appropriate treatment of the exits because of unknown reason and transitions out of the labor force. Three treatments have been considered. First we could have given up of these observations. Second, we could have treated them as i.i.d. censoring. These solutions may lead to biased estimates if some of the factors which determine the exit from the registers are correlated with the risk of employment and of PAP interview. The more rigorous approach would consist in defining two other risks - "other" and "out of labor force" - , correlated with the two risks already defined. This solution is burdensome and it appears that it gives similar results than the specification where these exits are treated as censoring.

that this spell lasts  $u_{1i}$  months and ends with a transition to state 1:

$$g(u_{1i}|\beta_1, \beta_2, X_{1i}, X_{2i}, \nu_{1i}, \nu_{2i}) = h_1(u_{1i}|\beta_1, X_{1i}, \nu_{1i})S_1(u_{1i}|P_i^* = 1, \beta_1, X_{1i}, \nu_{1i})S_2(u_{2i}|\beta_2, X_{2i}, \nu_{2i})$$

where, for  $k = 1, 2$ ,

$$S_k(u_{ki}|\beta_k, X_{ki}, \nu_{ki}) = \exp\left(-\int_0^{u_{ki}} h_k(s|\beta_k, X_{ki}, \nu_{ki})ds\right)$$

are the specific-risk survival functions, and

$$S_1(u_{1i}|P_i^* = 1, \beta_1, X_{1i}, \nu_{1i})S_2(u_{2i}|\beta_2, X_{2i}, \nu_{2i}) = \exp\left(-\int_0^{u_{ki}} \sum_{k'=1}^2 h_{k'}(s|\beta_{k'}, X_{k'i}, \nu_{k'i})ds\right)$$

Now if the AUD unemployment spell does not end for an observable transition to PARE unemployment, the individual likelihood contribution is different from those stated in a classical competing risks model because of the allowed defectiveness of the PAP interview risk: if no exit to PARE unemployment is observed, it may be either because the unemployed worker is an *AUD stayer*, or because he is a *PARE mover* but would have been notified by ANPE for his PAP interview only after the realization date of the other risk or censoring. Let  $p_{1,i}$  be the probability that the unemployed worker  $i$  disregards PARE unemployment as a destination state. It is the probability that he is a PARE stayer. In duration terms it is the probability that the PARE unemployment destination specific duration  $u_{1i}$  is infinite. When  $p_{1,i} > 0$ ,  $\lim_{t \rightarrow \infty} S_1(t) > 0$  and we are facing with a defective risk issue.  $p_{1,i}$  may depend on individual attributes and be estimated using dichotomic dependent variable model techniques:

$$p_{i,1} = P[P_i^* = 0] = \Phi(Z\gamma)$$

with  $P_i^* = 1$  if individual  $i$  chose the PARE system and  $P_i^* = 0$  otherwise. In relation with our theoretical framework,  $p_{i,1}$  is the probability that  $\phi_i \leq \underline{\phi}_i$ .

The individual contribution to the likelihood of an unemployed worker who has not been interviewed is:

$$\begin{aligned} g(u_i|\beta_1, \beta_2, X_{1i}, X_{2i}, \nu_{1i}, \nu_{2i}) &= \left(h_2(u_{2i}|\beta_2, X_{2i}, \nu_{2i})\right)^{\delta_{2i}} S_2(u_{2i}|\beta_2, X_{2i}, \nu_{2i}) \\ &\times \left[(1 - \Phi(Z\gamma))S_1(u_{1i}|P_i^* = 1, \beta_1, X_{1i}, \nu_{1i}) + \Phi(Z\gamma)\right] \end{aligned}$$

where  $\delta_{2i}$  if the spell is uncensored and 0 otherwise.



## 4.2 Estimation

We correct the estimates for the stock sampling bias we encounter as the paper treats unemployed workers registered as such at ANPE on June 2001. Stock sampling makes long unemployed workers over-represented in the sample which bias the estimates. To correct for this bias, we condition on the time spent at ANPE starting from the date of registration up to the date of the reform.

We assume that the destination specific unobserved heterogeneity terms  $\nu_1$  and  $\nu_2$  are drawn from a bivariate discrete distribution with two-load factors for each specific destination state term (Heckman and al., 1984; Bonnal and al. 1997; Terracol, 2003). The probability associated with each of the four points of support of the distribution are:

$$P_1 = Pr(\nu_2=\underline{\nu}_2, \nu_1=\underline{\nu}_1) \quad P_2 = Pr(\nu_2=\overline{\nu}_2, \nu_1=\underline{\nu}_1)$$

$$P_3 = Pr(\nu_2=\underline{\nu}_2, \nu_1=\overline{\nu}_1) \quad P_4 = Pr(\nu_2=\overline{\nu}_2, \nu_1=\overline{\nu}_1)$$

Setting such a specification may be understood as defining four types of unemployed workers (Addison and al., 2003): (i) high type for both risks, (ii) low type for both risks, (iii) and (iv) low type for a risk but high type for the other one (Appendix C - table 6). Unemployed workers with type  $(\overline{\nu}_2, \underline{\nu}_1)$  have strong connection with labor market, so that they quickly exit unemployment to employment. They are not notified in priority by ANPE, so that their hazard rate to PAP interview is low. We can think here of qualified workers who, according to the public services of employment, do not need as much support as the less qualified workers. Unemployed workers with unobserved heterogeneity  $(\overline{\nu}_2, \overline{\nu}_1)$  are employable and are quickly notified by ANPE. One may think here about insured unemployed workers. Unemployed workers with unobserved heterogeneity  $(\underline{\nu}_2, \overline{\nu}_1)$  have a low employability and they are treated in priority by ANPE for notification and job search support. At last, unemployed workers with type  $(\underline{\nu}_2, \underline{\nu}_1)$  have a low employability and are notified by ANPE a long time after they return their option form. One may think here about unemployed workers who are particularly disconnected from labor market.

Finally, the sample likelihood to be optimized is (4.1)  $\mathcal{L} = \prod_{i=1}^n \sum_{p=1}^4 (P_p \ell_{pi})$ , where

$\ell_{pi}$  is:

$$\begin{aligned} \ell_{pi} &= \left[ \frac{h_2(u_{2i}|\beta_2, X_{2i}, \nu_{2i}^p) S_2(u_{2i}|\beta_2, X_{2i}, \nu_{2i}^p) \left[ (1 - \Phi(Z_i\gamma)) S_1(u_{1i}|P_i^* = 1, \beta_1, X_{1i}, \nu_{1i}^p) + \Phi(Z_i\gamma) \right]}{S_2(a_i|\beta_2, X_{2i}, \nu_{2i}^p)} \right]^{\delta_{2i}} \\ &\times \left[ \frac{(1 - \Phi(Z_i\gamma)) h_1(u_{1i}|\beta_1, X_{1i}, \nu_{1i}^p) S_2(u_{2i}|\beta_2, X_{2i}, \nu_{2i}^p) S_1(u_{1i}|P_i^* = 1, \beta_1, X_{1i}, \nu_{1i}^p)}{S_2(a_i|\beta_2, X_{2i}, \nu_{2i}^p)} \right]^{\delta_{1i}} \\ &\times \left[ \frac{(1 - \Phi(Z_i\gamma)) S_2(u_{2i}|\beta_2, X_{2i}, \nu_{2i}^p) S_1(u_{1i}|P_i^* = 1, \beta_1, X_{1i}, \nu_{1i}^p) + \Phi(Z_i\gamma) S_2(u_{2i}|\beta_2, X_{2i}, \nu_{2i}^p)}{S_2(a_i|\beta_2, X_{2i}, \nu_{2i}^p)} \right]^{1-\delta_i} \end{aligned}$$

where  $\delta_{ki} = \begin{cases} 1 & \text{if } k \text{ is the observed exit state} \\ 0 & \text{if } k \text{ is not the observed exit state} \end{cases}$

$$\delta_i = \delta_{1i} + \delta_{2i};$$

$u_{2i}$  is the elapsed duration from the registration in ANPE and the exit date;

$u_{1i}$  is the elapsed duration from July, 1<sup>st</sup> and the exit date;

$a_i$  is the duration spent in AUD unemployment until July 1<sup>st</sup> 2001;

and  $\nu_{1i}^1 = \nu_{1i}^2 = \underline{\nu}_{1i}$ ,  $\nu_{1i}^3 = \nu_{1i}^4 = \overline{\nu}_{1i}$ ,  $\nu_{2i}^1 = \nu_{2i}^3 = \underline{\nu}_{2i}$  and  $\nu_{2i}^2 = \nu_{2i}^4 = \overline{\nu}_{2i}$ .

We estimate the impact of individual attributes and of the characteristics of the unemployment spell ongoing on July 2001 on the PARE take-up decision. We take into account the local labor market situation using departmental unemployment rates. For the unemployed specific hazard we set the value of the covariates at the value they take at the beginning of the unemployment spell (except for the benefit receipt for which we set the value when the unemployment spell ends). For the PARE specific hazard we set the value of the covariates on July 1<sup>st</sup> 2001. In the split-population equation we introduce covariates which should directly determine the take-up decision. In particular, we fix the value of the departmental unemployment rate, the unemployment benefit entitlement and the age at the level they reach at the moment of the reform (July 1<sup>st</sup> 2001).

Diploma, qualification and means-tested benefit receipt are taken as proxy for the informational issue and the stigma effect we previously explained. The underlying idea we detailed in the theoretical model is indeed that well connected workers who could use the informal job search channel pay a cost when participating in an UI system with counsel and job search assistance because such a system they suffer from a "leisure tax". Highly qualified workers are more likely to have an active social network than the rest of the unemployed population. This is the reason why we use qualification as a proxy of this "leisure tax effect". Elsewhere, being a means-tested benefit recipient may reflect the predisposition to participate in a socially marked program<sup>16</sup>.

<sup>16</sup>As the receipt of the minimum guaranteed income is a means-tested benefit, it is important to control

We estimate the Farewell's parametric model (1982): we use a Weibull distribution for the baseline hazard functions and a logistic specification for the selection equation. The choice of a Weibull distribution may be restricting as it just allows for monotone duration dependence. However, it is a widely used specification in models such as ours.

## 5 Results and comments

The results (tables 3 and 4) are consistent with the descriptive analysis, the intuitions that govern our theoretical model and previous results on ALMP non take-up (Rosholm and al., 2005). We find evidence of a PARE non take-up phenomenon along with self-selection to the PARE system: workers who experience greater difficulties on the labor market are more likely to transit to the PARE system, and to do it faster. We present here the results obtained from the maximization of the likelihood (4.1). Introducing the selection equation allows us for distinguishing the impact of individual characteristics on the take-up decision on the one hand, and on the time to notification for the PAP interview on the other hand. The introduction of the selection equation in the competing risks framework and the correction for unobserved heterogeneity do not noticeably change the estimated parameters. However, it increases by far the model log-likelihood. We simultaneously comment our results for the split-population equation (table 4) and the duration analysis (table 3). We focus on the PAP interview specific hazard rate.

Women have a higher probability than men to take-up PARE. Age and gender also have a significant effect on the interview specific hazards. Women have indeed a higher interview specific hazard than men, with runs along with Rosholm and al. results. 25-30 (resp. 40-50) year-old individuals wait a shorter (resp. longer) time than younger unemployed workers before being notified for their PAP interview.

The more the individual has previous unemployment spells, the higher the probability to take-up PARE is, but the lower the interview specific hazard is. The negative effect on the PARE hazard may be due to the fact that individuals with numerous previous unemployment spells are not notified in priority by ANPE. The reason for ANPE registration has also an impact on the probability to choose PARE and on the time to notification: laid off workers have higher probability and interview hazard, but workers entered into unemployment following the end of their contract have a lower probability to choose PARE and

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for other sources of income variations which can affect entitlement - such as insurance situation, family situation or education - in order to correctly understand the minimum guaranteed income receipt in terms of a more or less important stigma cost.

a lower interview hazard than the first job seekers. Individuals who were out of the labor force the previous 6 months or more and the workers who resigned have a probability to choose PARE no significantly different from first-job seekers. These results may reflect the effect of the degree of connection with the labour market. Moreover, workers who would greatly benefit from a participation in a ALMP are more likely to switch to PARE: unemployed workers who are immediately available for work and who are seeking a full-time permanent job have a higher probability to choose PARE than the rest of the unemployed population. Moreover, workers who resigned have a higher instantaneous probability to be notified than the first-job seekers. This runs counter to the connection with the labour market argument, but may reflect the stronger desire of resigning workers to participate in a project assessment. Last, long-term unemployment decreases the probability to choose PARE and the PAP interview specific hazard. This may reflect discouragement in job search activity or capture the fact that financial interest of constant benefits decreases along with the duration elapsed in the unemployment spell.

The selection equation and the time-event analysis both confirm the existence of informational and stigma effects. Being highly qualified (white collar) increases the probability to take-up PARE, although being a means-tested benefit recipient significantly increases the probability to choose PARE. The instantaneous probability of getting the interview indeed decreases with qualification but increases sharply with the receipt of the Minimum Guarantee Revenue. The higher the diploma, the lower the probability to choose PARE is. In the selection equation diploma seems to capture the stigma effect rather than the informational issue. In the time-of-event part of the model, the effect of the educational level deserves a longer comment. Diploma has a significant but small effect on the duration to the interview. Having a diploma significantly increases the PAP interview specific hazard, but all the less that the educational level is high. Educational level may capture both informational and stigma effects which should have opposite influence on the PAP interview specific hazard: the higher the diploma, the higher the psychological cost is, but the lower the informational cost is.

Elsewhere, the benefit entitlement has not the expected impact on the probability to choose PARE: being insured decreases the probability to take-up PARE. This may be due to the poor quality of our entitlement covariate. It may also be because it is not being insured which matters, but the position in the declining profile. With the existing data we are not able to measure this. This negative impact of benefit entitlement may however reflect the informational effect: insured individuals would lost out the more from

a monitoring and sanction reinforcement. The effect of the entitlement covariates on the instantaneous probability of being interviewed tends to confirm this explanation. Being insured increases the instantaneous probability to get the interview. Hence, one may think that some unemployed insured workers did not take-up PARE because they expected a sanction reinforcement, but those who decided to enter PARE are more quickly notified by the local unemployment agency.

Last, the probability to take-up PARE increases with the level of the departmental unemployment rate taken at the beginning of the second semester of 2001. This result runs along with the argument of a rapid expected return to employment: when he observes a high level of local unemployment, the individual may think that he will encounter difficulties to find a job. This positive impact of the local unemployment rate on the PAP interview specific hazard may also be explained by a lengthening in the waiting period before being notified to be interviewed. A higher unemployment rates indeed means that ANPE has to organize many interviews with a constant number of caseworkers.

The study of the baseline hazard parameters shows a positive PARE duration dependence, but a negative employment duration dependence. Because of the long waiting period before being notified by ANPE, the longer the unemployment spell, the more the stock of unemployment is treated and the greater is the instantaneous probability of being interviewed. The usual human capital depreciation and discouragement arguments explain the negative duration dependence for employment.

The covariance between destination state specific unobserved heterogeneity components is significantly negative:  $cov(\nu_1, \nu_2) = -0.111$ . It means that individuals who have longer unemployment spells are more rapidly notified by ANPE to be interviewed.

The sample is composed at 90% of high PAP type and low employment type individuals (unemployed workers with a low employability and a priority notification). The 10% remaining are composed of individuals of high employment type and low PAP type (unemployed workers with a high employability and a non priority notification).

<b>exit from AUD unemployment to :</b>	<b>interview</b>	<b>employment</b>
<b>intercept</b>	-4,780***	-2,685***
<b>gender (male)</b>		
female	0,073***	-0,091***
<b>age on July 2001 (&lt;25 years old)</b>		
25-30 years old	-0,034***	-
30-40 years old	0,016	-
40-50 years old	0,055***	-
≥ 50 years old	-0,043***	-
<b>age at registration (&lt;25 years old)</b>		
25-30 years old	-	-0,144***
30-40 years old	-	-0,154***
40-50 years old	-	-0,266***
≥ 50 years old	-	-1,022***
<b>diploma (none)</b>		
< secondary	0,090***	0,167***
secondary	0,108***	0,266***
> secondary	0,112***	0,400***
<b>qualification (not white collar)</b>		
white collar	-0,130***	0,079***
<b>RMI receipt</b>	0,270***	-0,244***
<b>number of previous unemployment spells</b>	-0,004**	0,037***
<b>motivation for registration (1<sup>st</sup> entry)</b>		
lay off	0,047***	0,032
resignation	0,058***	0,130***
end of fixed term contract	-0,027*	0,233***
end of inactivity > 6 months	0,041*	-0,048
other	-0,025	-0,197***
<b>duration elapsed up to July 1<sup>st</sup> 2001 (&lt; 3 months)</b>		
3-6 months	-0,074***	-
6-12 months	-0,122***	-
12-24 months	-0,149***	-
≥ 24 months	-0,221***	-
<b>kind of unemployment (not immediately available to work)</b>		
type 1	1,556***	-
type 2 or 3	1,529***	-
<b>contract wanted (fixed term contract)</b>		
permanent contract	-	0,464***
<b>insured</b>	-	-1,068***
<b>insured on July 2001</b>	0,187***	-
<b>departmental unemployment rate</b>	-0,068***	-0,080***
$\bar{\nu}$	0,734***	1,738***
P <sub>1</sub>		1,882.10 <sup>-8</sup>
P <sub>2</sub>		0,096
P <sub>3</sub>		0,904
P <sub>4</sub>		4,590.10 <sup>-4</sup>
<b>baseline hazard parameters (Weibull distribution)</b>	1,127 <sup>†††</sup>	0,758 <sup>†††</sup>

note : number of observations : 258660; log-likelihood=-608560.465  
\*\*\*=1% significant; \*\*=5% significant; †††=significantly different from 1 at 1%

TAB. 3 – Competing risks model with split-population equation, unobserved heterogeneity and stock sampling correction

probability of being a PARE mover	
<b>intercept</b>	4,722***
<b>gender (male)</b>	
female	1,125***
<b>age (July 1<sup>st</sup> 2001 (&lt;25 years old))</b>	
25-30 years old	-0,461***
30-40 years old	-0,538***
40-50 years old	-0,305**
≥ 50 years old	0,428***
<b>married</b>	0,480***
<b>number of children</b>	0,258***
<b>diploma (none)</b>	
< secondary	-0,855***
secondary	-1,832***
> secondary	-2,182***
<b>qualification (not white collar)</b>	
white collar	0,194
<b>RMI receipt</b>	0,582***
<b>number of previous unemployment spells</b>	0,426***
<b>duration elapsed from registration up to July 1<sup>st</sup> 2001 (&lt; 3 months)</b>	
3-6 months	0,009
6-12 months	-0,158
12-24 months	-0,382**
≥ 24 months	-0,862***
<b>motivations for registration (1<sup>st</sup> entry in the labour force)</b>	
lay off	1,112***
resignation	0,309
end of fixed term contract	-0,747***
end of an inactivity period > 6 months	0,018
other	-0,190
<b>kind of unemployment (not immediately available to work)</b>	
type 1	3,064***
type 2 or 3	-0,151
<b>insured on July 2001</b>	-1,712***
<b>departmental unemployment rate (July 1<sup>st</sup> 2001)</b>	0,062***

note: \*\*\*=1% significant;\*\*=5% significant

TAB. 4 – Table (3) continued: Split-population equation

## Conclusion

The decision to participate in the PARE UI system is of major interest in terms of policy design and evaluation. We have proposed a theoretical framework to model the PARE take-up decision. This model takes explicitly into account the disutility ALMP participation may induce. We have assumed that the unemployed individuals made their decision depending on the consequences PARE participation would have on their job opportunities and on their job search strategy. Empirically, we use defective duration techniques that allow for the presence of long-term survivors in the data. These methods are shown efficient to correct for the right-censoring we encounter. The descriptive analysis realized using Kaplan-Meier estimates and the results obtained from a competing and defective risks model give evidence of a PARE non take-up phenomenon. The estimated PARE non take-up rate is smaller than 10% and is significantly different from 0. We find a self selection to PARE. The workers who experience greater difficulties on the labor market are more likely to take up PARE. They are also more rapidly interviewed. Highly qualified unemployed individuals who are not recipient of the main French means-tested benefit are less likely to choose the PARE system. Hence, our results support the underlying ideas of our theoretical model and tend to confirm the presence of stigma, as well as time cost associated with the participation in an UI system with counseling and job search assistance. However, for most of the unemployed workers, these costs were not large enough to prevent from taking up PARE.



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## A Descriptive analysis

### A.1 Individual characteristics

	entire sample	subsample without any PAP interview	subsample with a PAP interview
<b>Gender (%)</b>			
male	41,5	42,1	40,7
female	58,5	57,9	59,3
total	100	100	100
<b>Age (July 1<sup>st</sup> 2001)</b>			
mean	36	35	37
1 <sup>st</sup> quartile	28	26	28
median	34	34	38
3 <sup>rd</sup> quartile	44	42	46
<b>Education level (%)</b>			
no diploma	24,7	24,5	25,0
< secondary	46,3	45,8	46,9
secondary	14,6	14,9	14,2
> secondary	14,4	14,8	13,8
total	100	100	100

## A.2 Characteristics of the unemployment spell

	entire sample	subsample without any PAP interview	subsample with a PAP interview
<b>Motivation for registration (%)</b>			
ongoing employment spell	3,3	5,5	0,5
economic firing	7,3	6,1	8,7
other lay off	12,9	11,2	15,0
resignation	5,0	4,9	5,0
end of fixed term contract	27,3	27,0	27,7
end of temporary work	6,0	6,4	5,5
end of conversion contract	2,3	1,7	3,0
first entry in the labor market	5,8	6,3	5,2
re-entry in the labor market*	3,2	3,0	3,5
other	26,2	27,7	25,9
<b>Elapsed duration from registration up to July 1<sup>st</sup> 2001 (months)</b>			
mean	17 <sub>1/2</sub>	15 <sub>1/2</sub>	20 <sub>1/4</sub>
1 <sup>st</sup> quartile	3 <sub>3/4</sub>	3 <sub>1/4</sub>	4 <sub>1/4</sub>
median	9 <sub>1/2</sub>	8 <sub>1/2</sub>	10 <sub>3/4</sub>
3 <sup>rd</sup> quartile	22 <sub>1/4</sub>	19 <sub>1/2</sub>	25
<b>Type of unemployment (%)</b>			
<i>Immediately available to work seeking</i>			
- a full time permanent job	67,2	66,1	68,5
- a part time permanent job	15,8	13,0	19,4
- a fixed term job	9,9	8,8	11,3
<i>Not immediately available to work because of</i>			
- training, illness, pregnancy...	3,8	6,6	0,3
- already in employment	3,3	5,5	0,5
total	100	100	100
<b>Receipt of an unemployment benefit on July 2001 (%)</b>			
uninsured	39,6	46,1	31,2
insured	60,4	53,9	68,8
total	100	100	100
<b>Receipt of the Minimum Guaranteed Revenue (RMI) during the spell (%)</b>			
no	86,7	87,9	85,2
yes	13,3	12,1	14,8
total	100	100	100

note: \* after having been out of the labor force longer than 6 months

## B Stratified Kaplan-Meier estimates

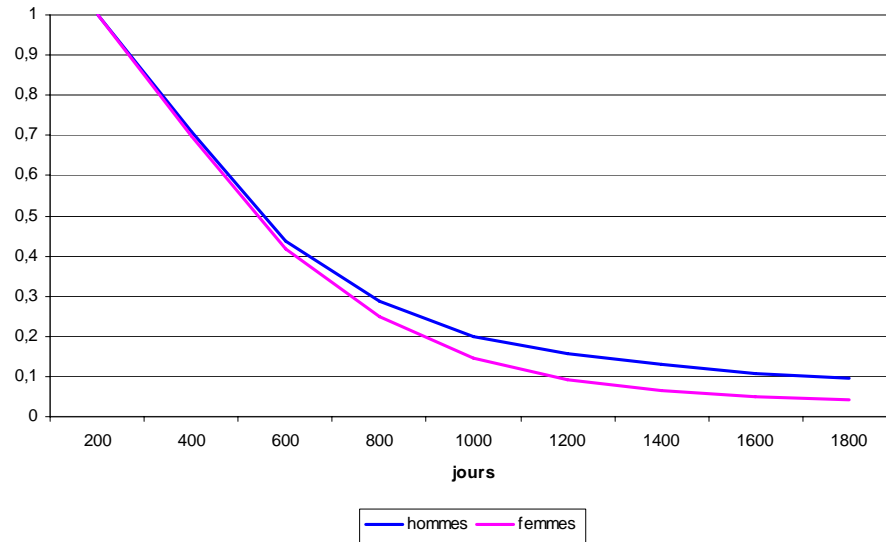


FIG. 4 – Kaplan-Meier estimates of the duration up to the PAP interview stratified by gender

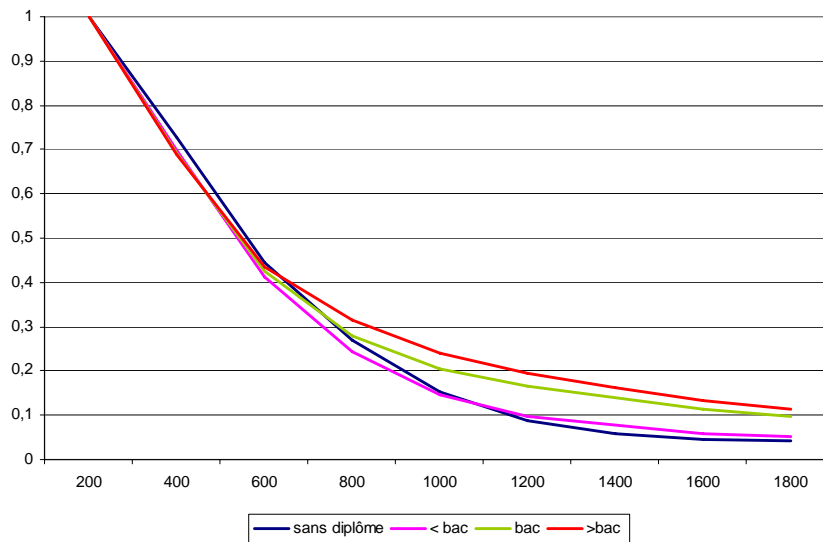


FIG. 5 – Kaplan-Meier estimates of the duration up to the PAP interview stratified by diploma

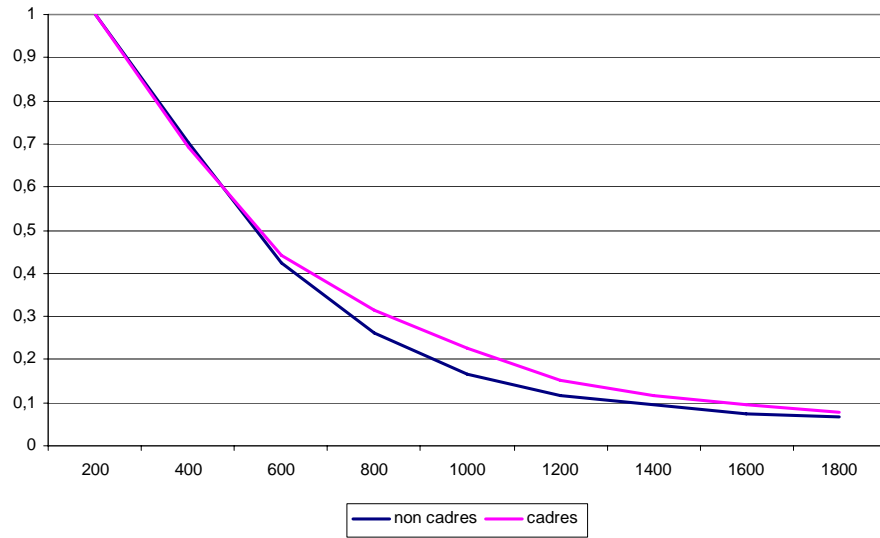


FIG. 6 – Kaplan-Meier estimates of the duration up to the PAP interview stratified by qualification

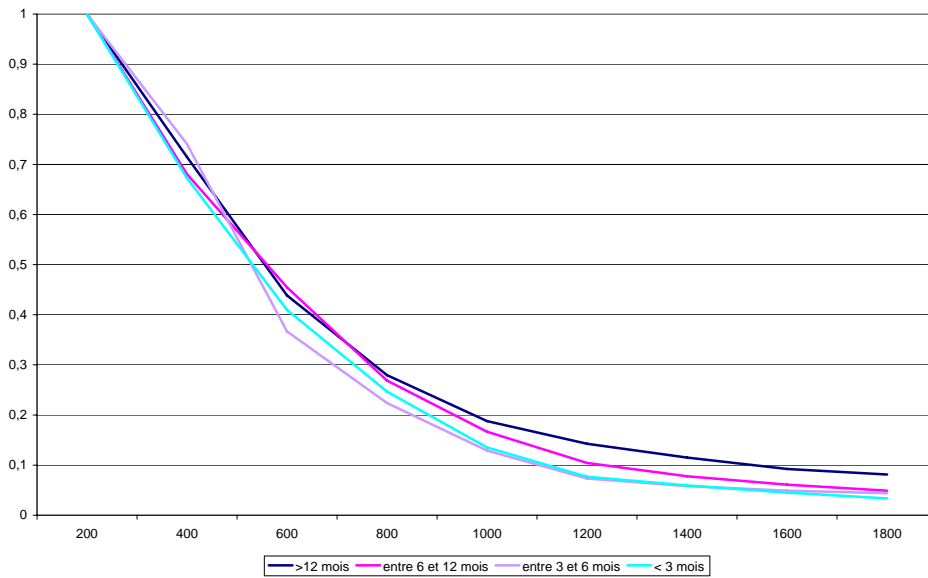


FIG. 7 – Kaplan-Meier estimates of the duration up to the PAP interview stratified by elapsed duration from registration up to July 1<sup>er</sup> 2001

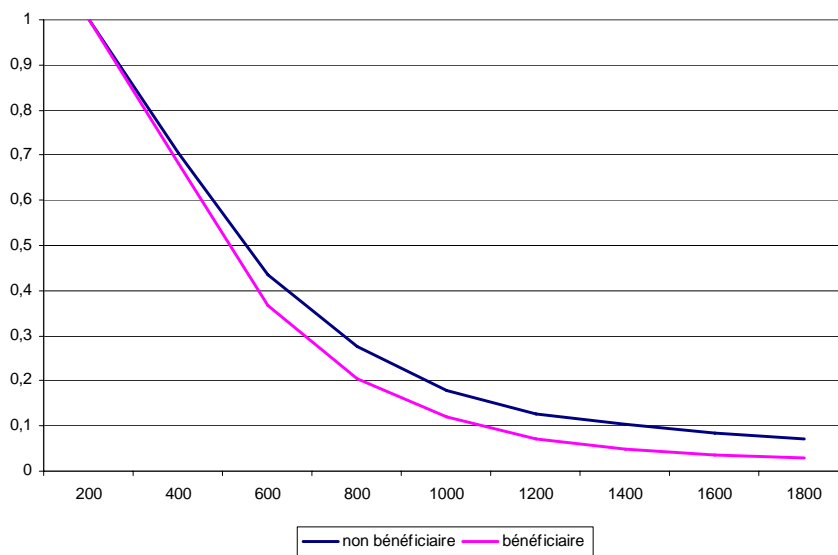


FIG. 8 – Kaplan-Meier estimates of the duration up to the PAP interview stratified by means-tested benefit

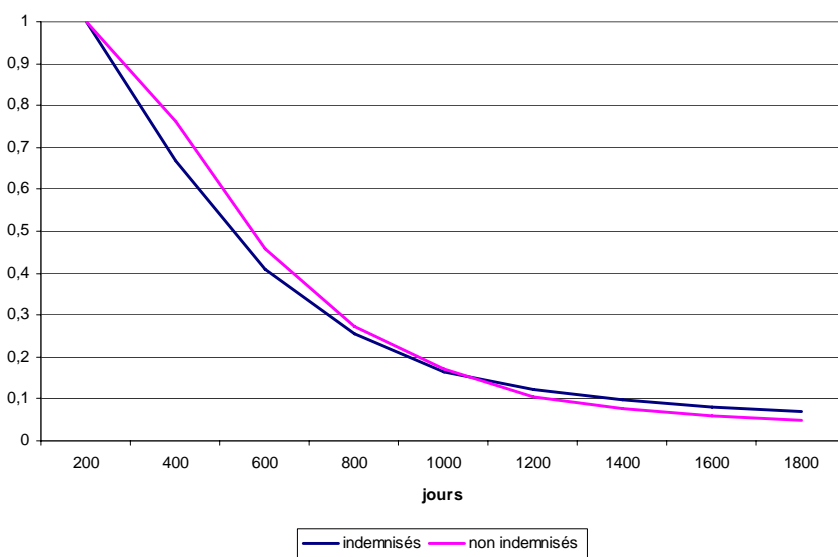


FIG. 9 – Kaplan-Meier estimates of the duration up to the PAP interview stratified by unemployment benefit entitlement on July 2001

## C Statistical model

destination	frequency	percentage
<b>PARE</b>	125 169	44,7
<b>Employment</b>	41 137	14,7
<b>Censoring</b>	113 543	40,6
among with		
- <b>out of the labor force</b>		
<i>illness, pregnancy, workplace accident</i>	9 291	8,3
<i>job search exemption</i>	7 260	6,4
<i>retirement</i>	457	0,4
<i>military service</i>	50	0,1
<i>other reason for no job search activity</i>	5 895	5,2
- <b>crossing off</b>		
<i>absence at control</i>	44 119	39,2
<i>non presentation following a notification</i>	10 127	9,0
<i>other administrative crossing off</i>	976	0,9
- <b>unobserved end</b>	1 041	0,98
- <b>other</b>		
<i>change of local agency</i>	5 534	4,9
<i>no file up-date</i>	1 065	0,9
<i>other cases</i>	27 720	24,6

TAB. 5 – Frequency of the state-specific transitions from the AUD unemployment spell

	high type for employment $\bar{\nu}_2$	low type for employment $\underline{\nu}_2$
low type for PAP interview $\underline{\nu}_1$	employable non priority notification	unemployable non priority notification
high type for PAP interview $\bar{\nu}_1$	employable priority notification	unemployable priority notification

TAB. 6 – Types typology