Unemployment insurance and management of the older workforce in a dual labor market: Evidence from France

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Version

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Unemployment insurance and management of the older workforce in a dual labor market: Evidence from France ☆

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HIGHLIGHTS

- Is unemployment insurance (UI) used as an early retirement scheme?
- We analyze the effect of a cut in entitlement duration on older workers' UI inflow.
- A displacement of the spike from age 55 to age 57 appears clearly for insiders.
- There is no or little effect for workers far from retirement and for outsiders.
- The reform rose the mean age of workers dismissed close to retirement by 4 months.

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ABSTRACT

In a context of population aging, reducing early exit from the labor force is a major challenge. In this domain, the role of unemployment insurance (UI) is probably underestimated and its statistical assessment remains insufficient. And yet, when considering a possible separation, it is likely that workers who are close to retirement, and thus their employers if they wish to reduce their workforce, care about UI. In particular, they are likely to care about whether or not, potential benefit duration is long enough to cover the time until retirement. This paper provides evidence in support of this hypothesis for some worker profiles. The analysis is conducted using data from the French employment agency over the period 2001 to 2005. It is based on a natural experiment: on January 1, 2003, the potential benefit duration of UI entrants was sharply reduced. Econometric analysis of the age patterns of UI inflow reveals that the age incentives provided by UI rules greatly influence labor market behaviors: dismissals of insiders close to retirement are often scheduled so that they can receive benefits until retirement. We estimate that the reform increased the mean age at job termination of workers dismissed close to retirement by 4 months. Our findings confirm that UI rules have an impact on inflow into unemployment and that UI is viewed by some employers and/or some workers as an early retirement scheme rather than as insurance against the risk of job loss. Thus, addressing the issue of older workers' participation in the labor market requires consideration of the joint impact of UI and retirement system rules.

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1. Introduction

In the context of increasing longevity, OECD countries are finding it difficult to ensure the future of their pension systems. In order to encourage later retirement, the number of quarters of contributions required to receive a full pension and the statutory pension age have been increased in several countries. Effects have often been lower than expected. For instance, Bozio (2008) shows in the case of the 1993 French pension reform, that requiring one additional quarter of contributions for a full pension led to an average increase of only

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Table 1
UI rules for older workers and their changes over 2001–2005.

2001's agreement		Employment contracts ending between Jan. 1 2001 and Jun. 30 2002			
Entitlement class	5	6		7	8
Employ. record (ER, months)	≥14 m/24	≥14 m/24 but <27 m/36		≥27 m/36	≥27 m/36
Age	<50	≥50		50–54	≥55
PBD (months)	30 m	45 m		45 m	60 m
Jul. 2002's transitory rules		Employment contracts ending between Jul. 1 2002 and Dec. 31 2002			
Entitlement class	5		6′		8′
ER (months)	≥14 m/24		≥14 m/24		≥27 m/36
Age	<50		≥50		≥55
(Contrib. to the pension syst.)					(≥100 quarters)
PBD (months)	30 m		45 m		60 m
2003's reform		Employment contracts ending between Jan. 1 2003 and Dec. 31 2005			
Entitlement class	B			C	D
ER (months)	≥14 m/24			≥27 m/36	≥27 m/36
Age				≥50	≥57
(Contrib. to the pension syst.)					(≥100 quarters)
PBD (months)	23 m			36 m	42 m

1.5 months in retirement age, and encouraged individuals to claim more disability pensions.[1] In fact, a large proportion of older workers leave employment before their statutory retirement age: in 2010 in France, the employment rate among 55–64 year olds was 40%, which is below the average for the 27 EU countries (46%) and far from the 50% EU target set by the Lisbon strategy (Dares, 2011). Some measures were enacted to address the problem of insufficient participation of older workers in the labor force. One of them, which relied on special employment protection for older workers (called "contribution Delalande", see Appendix C), had very little effect in preventing dismissals (Behaghel et al., 2008) and was finally canceled. A more lasting measure was to reduce entries into public early retirement or disability programs, which had become very widespread in the 1980s (Ben Salem et al., 2010).

The role of unemployment insurance (UI) in exit from the labor force is sometimes forgotten, or at least underestimated, and its statistical importance has not been well assessed. And yet, French UI rules are particularly favorable, especially to older workers. For all workers, the level of benefits is determined by previous wages with a good replacement rate: on average UI recipients get 69% of their previous net salary and the maximum benefit is more than €6000 (Unédic, 2013). Potential benefit duration (PBD) depends on the worker's previous work history and age at the date of job termination. PBD is quite long compared to many other countries: the maximum benefit duration over the period in question was 5 years for older workers with a continuous work history (it is 3 years today.) The rules are such that older workers, who often have high tenure and high wages, automatically receive higher benefits for longer periods than younger workers. Moreover, the French UI system includes more generous specific provisions for older workers. First, they have access to specific entitlement classes with longer PBD. Second, until recently, they could apply for exemption from active job search (see Appendix C). Third, and this point is particularly important in this paper, under certain conditions, workers over 59.5 years of age (or 60 from 2003) can continue to receive benefits until they reach the statutory retirement age, even if their PBD is exhausted. Given these favorable terms, there is a strong incentive for older workers dismissed before eligibility for a full pension to draw UI benefits rather than means-tested benefits because the latter are much lower in most cases and because compensated unemployment is taken into account in contribution record required to receive a full retirement pension. Thus there is good reason to suspect that UI can be used as a pathway

to retirement for older workers (Hairault, 2012), especially those employed by firms with many older workers or firms facing economic difficulties. For these firms, dismissing older workers first, particularly those close to retirement, may appear more socially acceptable than placing the burden of job loss on other employees. There may even be a coincidence between the interests of firms which want to reduce a costly segment of their workforce while avoiding social conflict and the interests of older employees who are happy to stop working before the legal retirement age.

In this paper, the hypothesis that UI is used as an early retirement scheme is tested. If such is the case, it should be visible empirically: the age at which older workers begin to draw UI benefits should be consistent with PBD in such a way to enable them to bridge the gap until eligibility for a full pension. Therefore, changing PBD (or the statutory retirement age) should impact the age at which older workers begin to receive UI benefits. The analysis is based on a change in UI rules which occurred in France on January 1, 2003. At that time, because the UI system was facing financial difficulties, UI entitlement durations were reduced for new entrants, especially for those aged 50 or over. For the latter, PBD was reduced by 20 months on average (see Table 1). However, employment record (ER) requirements themselves did not change, which means that the new UI rules induced no direct selection effects. It is thus possible to test the effect of the reduction in potential benefit duration on age-related workforce management practices.[2] The data used come from the FHS registry of the French agency in charge of UI (Pôle emploi) which provides information about spells of compensated unemployment over the past 10 years; it enables us to study in detail the age pattern of UI inflow. One other advantage of this administrative data source is that it specifies the type of job termination: this enables us to make inferences about firm's workforce management practices and about the bargaining power of dismissed workers. However only spells of unemployment are observed, so it is not possible to estimate individual probabilities of entering unemployment.

Econometric analysis of the distribution of inflow into UI benefits by age confirms hypothetical predictions for workers who are dismissed close to retirement: their UI inflow age pattern is consistent with the age incentives embodied in UI rules and responds to changes in these incentives. Three main types of behavior are identified as a response to UI rules: "entitlement effects," "job search exemption effects" and "distance-to-retirement effects." "Entitlement effects" correspond to a

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[1] In the case of Germany, Hanel (2010) observes that when benefit receipt is delayed, employment spells grow longer, but by a lesser duration.

[2] This quasi-experimental setting has already been studied by Fremigacci (2010) in order to identify the effect of PBD reductions on older workers' unemployment duration.

propensity of the parties to an employment contract to schedule job termination so that the worker gains access to longer PBD. "Job search exemption effects" concern the tendency to schedule job terminations so that workers will be exempt from the UI active job search requirement. Finally, "distance-to-retirement effects" concern the tendency to schedule job terminations so that workers can receive UI benefits until they are eligible for a full pension. The existence and magnitude of these effects are found to be heterogenous. They vary depending on the type of employment relationship considered. The effects are strongest for workers with a long ER whose job termination takes the form of a "layoff for personal reasons"; they barely exist for workers ending a fixed term contract with an unstable previous work history (shorter ER). These findings provide the basis for quantifying the impact of the reduction in PBD on the mean age at job termination of workers who are dismissed close to retirement using a difference-in-differences approach: the average effect is estimated to be +4 months, i.e. workers who were dismissed close to retirement were on average 4 months older after the reform than before.

This paper adds to the existing literature in several ways. First, it contributes to the literature on the interaction between UI and other policies (e.g. Pellizzari, 2006; García-Pérez et al., 2013. Kyyrä, 2010) by providing explicit and detailed evidence of how the institutions involved – UI, the pension system and employment protection – interact in shaping labor demand and supply behaviors. Second, new evidence of the impact of UI rules (PBD) on inflow into unemployment is provided, a subject that has been studied less that outflow in the literature on UI. Third, the findings presented below are useful for public policy since they highlight the role of UI rules in explaining the low level of older workers' participation in the labor force in OECD countries such as France; a quantification is provided of the effects of an UI reform which can be compared to changes in other programs, such as the pension system. Lastly, the rich administrative data source (which identifies in particular the legal categories of job terminations), combined with the complexity of French UI rules (which distinguish several categories of entitlement) makes it possible to identify the factors at work and highlights the importance of the distance to retirement. Like some other recent analyses (e.g. Rebollo-Sanz, 2012), we argue that the effects of UI on the labor market cannot be attributed to workers' reactions alone, and that employers' behaviors are also important.

The paper is organized as follows. Section 2 gives an overview of previous studies on the relationship between potential benefit duration and inflows into unemployment. Section 3 describes the institutional background of the French UI and pension systems and discusses the incentives linked to their rules (incentives analysis). Section 4 presents the data and the descriptive analysis. Section 5 presents an econometric analysis of the age pattern of UI inflow before and after the reform. In Section 6, the effect of the reduction in PBD on the age at the date of UI admission is estimated. Section 7 concludes.

2. Literature

This paper contributes to the literature on the effect of UI on inflow into unemployment. As noticed by Tatsiramos and van Ours (2012), research on UI more often focuses on unemployment outflow. Many papers measure the impact on *unemployment duration* of PBD (e.g. Card and Levine, 2000; van Ours and Vodopivec, 2006; Le Barbanchon, 2012) and/or of benefit levels (e.g. Lalive et al., 2006; Chetty, 2008), for the unemployed in general or for the specific group of older job seekers (Lalive, 2008; Kyyrä and Ollikainen, 2008; Fremigacci, 2010). They show that generous UI discourages job search and thus increases unemployment duration. Empirical evidence on the effects of UI generosity on *unemployment inflow* is more rare. And most studies on inflow focus on requirements concerning eligibility for unemployment benefits i.e. eligibility effects (Christofides and McKenna, 1995, 1996; Andersen and Meyer, 1997; Green and Riddell, 1997). They find that

changes in entrance requirements have a significant impact on employment duration. Few papers study effect of PBD on inflow. And yet, Lalive et al. (2011) show that the impact of PBD on the equilibrium unemployment rate via inflow may be larger than its impact via outflow. To the best of our knowledge, three papers focus on the effect of PBD on older workers' inflow in three different countries: Tuit and van Ours (2010) on The Netherlands, Winter-Ebmer (2003) on Austria and Grogger and Wunsch (2013) on Germany. Tuit and van Ours (2010) analyze the effect of a reduction in PBD on inflow age patterns: they observe a large spike in unemployment inflow for workers just above age 57.5 before a reform, when PBD was higher for workers aged 57.5 or more; this spike disappeared after the reform abolished extended benefits for older workers. Winter-Ebmer (2003) and Grogger and Wunsch (2013) estimate the effect of PBD on the rate of exit from employment. Winter-Ebmer (2003) finds that older workers' entry into unemployment in regions of Austria where PBD was extended for older workers rose by between 4 and 11 percentage points. The German reform observed by Grogger and Wunsch (2013) reduced PBD for older workers. They find a fall in rates of exit from employment after the reform, but only among the oldest workers that is those close to retirement. They explain differences in responses to the reform by using a model where UI is treated as a bridge to retirement.

Researchers who analyze the link between PBD and inflow of older workers into unemployment have put forward various theoretical explanations. Some argue that firms have incentives to fire less productive older workers who are close to retirement at the point when they become eligible for extended unemployment benefits because of those workers' low propensity to legally challenge the dismissal (Tuit and van Ours, 2010). Winter-Ebmer (2003) adds that, under implicit contracts, the wages of workers with longer tenure are above their productivity levels, which creates an incentive for firms to dismiss those workers before others. Firms' concern about their reputation among the current workforce are usually assumed to prevent such behavior, but this concern may fade if UI compensation is regarded as generous enough (Lalive, 2008). One consequence is that this inflow effect should be larger for workers with long tenure. These interpretations highlight the employer's role. Eligibility for extended UI benefits may induce employees to quit and collect benefits (Lalive et al., 2011). However, in the French case, this is quite unlikely without complicity on the part of employers since eligibility for UI explicitly requires that job termination be involuntary.[3] It is also possible that workers are less willing to work hard when they reach the age of extended benefits because unemployment becomes more attractive (Tuit and van Ours, 2010).

The interesting thing about the French case is that the complexity of the unemployment benefit system (see Section 3.3) provides information on the type of behaviors involved. Replicating the analyses described above (especially Tuit and van Ours (2010)) within the French context is thus of particular interest for several reasons. First, the French UI system reflects the dual nature of the national labor market: data analysis can reveal whether the early retirement practices described above concern both insiders and outsiders or only insiders. Most previous studies (Lalive et al., 2011; Grogger and Wunsch, 2013) focus on insiders, that is, workers with strong labor force attachment and stable work histories. Second, it is possible to distinguish between different effects, in particular an "entitlement effect" and a "distance-to-retirement effect," as well as to assess the use of UI as a bridge to retirement. It is also possible to study changes in the composition of UI inflows, in terms of sociodemographic characteristics, wages and reasons for job termination. This is particularly useful in interpreting findings, most notably in analyzing bargaining power. Finally, the effect of the reform on mean age at job termination can be quantified, making it possible to compare the impact on older workers' employment of a reduction of

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[3] Involuntary from the worker's point of view.

UI benefit duration to the impact of alternative policies such as a reform of the pension system.

3. Institutional background

This section presents the institutional background in detail. It discusses French labor market dualism, the UI and the pension systems and interactions between the two systems, and the policy reforms that took place over the years 2001 to 2005, which is the period under study. On the basis of this analysis of policies toward older workers (aged 50 or more), critical age thresholds are identified in terms of incentives generated by the interaction between pension system and UI rules.

3.1. Labor market dualism

The French unemployment benefit system operates within a dual labor market. A sharp differentiation exists between workers under "indefinite-term" employment contracts who enjoy strong protection, and those under "fixed-term" contracts. The latter represent the majority of flows both in and out of employment, but a minority of the stock of employees. Employment instability of workers under fixed-term contracts makes it difficult for them to attain long employment records which condition access to UI benefits and their duration (see the detailed description below).

Dualism in UI inflow is revealed by the legal categories of job terminations. Over the years 2001 to 2005, UI inflows were classified into four main legal categories: (1) end of contract, (2) economic redundancy (including those with a special form of job search assistance called "Pap anticipé"), (3) layoff for personal reasons and (4) resignation. Since UI only covers involuntary job loss, resignations represent a very small share of admissions (2% of the sample). The three other legal categories involve employer decisions. Each category entails a particular set of legal rights and duties for both the employer and the employee. Each category reflects different workforce management practices and involves stronger or weaker employee bargaining power in negotiating the terms of the separation. In particular, the risk of legal challenge from the worker varies considerably depending on the legal category of termination (see Appendix D): this risk is highest in the case of layoff for personal reasons; it is lowest in the case of economic redundancy; it barely exists for termination of fixed-term contracts (Serverin and Valentin, 2009).

Hence, job termination categories convey information about the employment relationship. Economic redundancies or layoffs for personal reasons allow for legal challenges by dismissed workers (and thus for bargaining on the terms of the separation); terminations following the end of a contract leave little room for legal challenges and thus for bargaining.

3.2. The pension system

The French pension system for private sector workers has two components: an earnings-related public pension, topped up by compulsory supplementary schemes. Under the rules in place from 2001 to 2005, an old age pension could be claimed at any age after 60: the pension was full rate for those who had contributed for at least 160 quarters (40 years) and reduced for each missing quarter of contributions. Retirees could receive a full pension if they began to draw a pension at age 65 even if they had not contributed for 160 quarters.

A reform of the pension system took place in 2003. It did not impact the statutory retirement age. The most important measure was to reduce inequalities between the public and private sectors with a rise in the number of years of contributions required for a full pension in the public sector (from 37.5 to 40 years). Over the period considered here, that is 2001 to 2005, there was no increase in the number of years of contributions required for a full pension in the private sector.

Between 2001 and 2005, several early retirement schemes existed but most of them were in the process of closing or targeted on very restricted groups: the number of older workers entering them was decreasing (Ben Salem et al., 2010; Behaghel et al., 2011).[4] This period is of particular interest since it corresponds to a decline in recourse to early retirement: a number of public programs that facilitated management of older workforce were abolished or access to them was reduced. Was UI used as a substitute for these early retirement programs?

However, the 2003 pension reform introduced a new early retirement scheme for workers who had begun to work at a young age and who had worked for 40 years. They could retire at age 56, 57, 58 or 59, depending on the age at which they started to work and on the length of their contributions record. Flows into this program were quite large from 2004 onwards. This issue is beyond the scope of this paper, but, if there is substitution between early retirement schemes and UI, this new early retirement scheme may have reduced inflow into unemployment for corresponding age groups. In Section 6, robustness checks are carried out (by varying the period studied); they do not change the main results.

3.3. The unemployment benefits system

The French unemployment benefits system consists of two components: unemployment insurance (UI, "régime d'assurance") and unemployment assistance (UA, "régime de solidarité"). UI is compulsory for all employees except civil servants. Eligibility for UI benefits requires a minimum past employment record (ER) and several other conditions: job loss must be involuntary (that is, it must be due to dismissal or end of a fixed-term contract); the worker must be registered as job seeker; the worker must be below retirement age; etc. Benefits end when individuals are no longer unemployed or when they exhaust their PBD. PBD depends on the length of previous ER and on the worker's age at the date of job termination (see Table 1). UA benefits are paid to jobseekers who are not or are no longer entitled to UI, under certain conditions. In particular, unlike unemployment insurance benefits, UA benefits are means-tested, i.e. the amount depends on household income. Fig. 1 compares daily amounts of UI benefits and three different types of UA benefits for different previous wage levels in July 2003. UI benefits are higher than the most favorable UA benefits (AER) for workers who were receiving a gross daily wage of more than €50.[5] But AER concerns only older unemployed workers under 60 years of age who have already attained a complete contributions record for the pension system (160 quarters). Those workers have had very long careers without interruptions and are likely to have high wages (because wages often increase with seniority in France) or to be very close to the statutory pension age. Other assistance benefits ("ASS" and "ASS majorée") are lower than unemployment benefits in all cases (see Fig. 1). UI rules are most likely to influence the labor market behaviors of workers whose wages are high enough to make the unemployment insurance system more favorable than unemployment assistance; hence, the influence of UI rules should be the strongest for workers with the highest wages.

UI rules are the result of regularly scheduled bargaining between labor unions and employers' organizations which leads to an agreement ("convention d'assurance chômage") that usually applies over the next

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[4] One early retirement scheme was administered by the national employment fund (FNE). Under this scheme, early retirement was possible at age 57 (or even 56 under certain conditions) within the framework of an agreement negotiated by the employer with the State, under which the employer promised to limit the number of layoffs. Flows into this program were very low over the period under study. Another early retirement program was managed by unions: it allowed workers with 40 years of activity to stop working before 60 if young workers were hired to replace them; this program was stopped in 2002. Some people who had worked in an unhealthy or physically stressful environment (at least 15 years on an assembly line or night work or exposed to asbestos) could also claim their pensions before reaching the legal minimum retirement age.

[5] About €1500 per month for a full time employee. In comparison the gross monthly minimum wage was €1190 at that time.
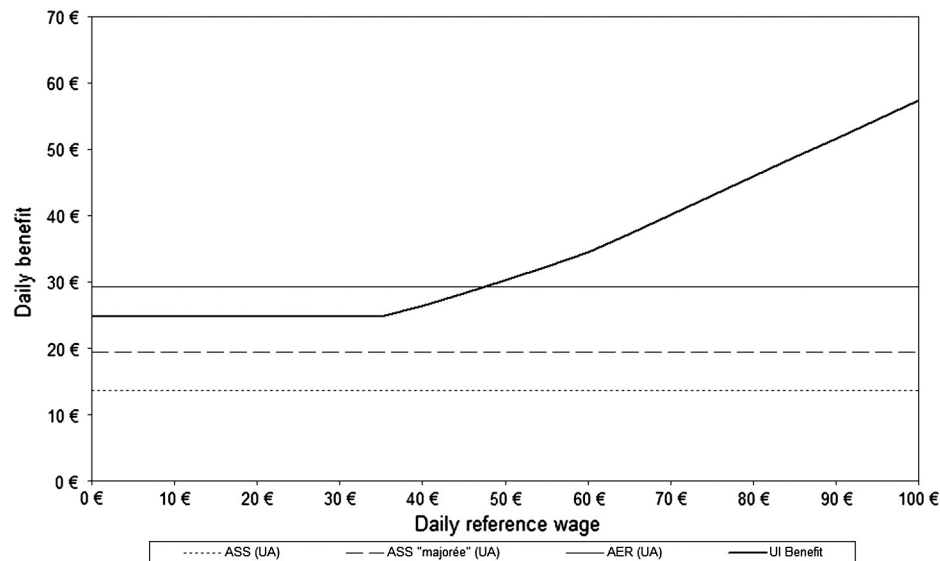
Fig. 1. Three types of UA benefits and UI benefit as a function of a worker's daily reference wage, July 2003 parameters (source: Unédic).

3 years. However, amendments to these agreements can be negotiated at any time. In 2001, in a particularly favorable economic context, more generous UI rules were adopted: rather than decreasing with the duration of the unemployment spell, the amount of unemployment benefits was made constant; in exchange, recipients had to participate in an active job search program called "PARE" (see Blasco, 2008, for more details). Over the 2001–2005 period, two main changes occurred in compensation rules: a minor change applied to older workers whose jobs ended between July 1, 2002 and December 31, 2002; the second change was long-lasting and is referred to as the "reform" hereafter. On December 20, 2002, unions and employers' organizations agreed on new UI rules, applicable to the inflow of claimants whose job terminated after January 1, 2003. In a context of very high deficits for the UI fund (because of the generosity of previous rules as well as the economic slowdown which had reduced income and increased spending), negotiators chose to maintain a high replacement rate but to sharply reduce PBD. This reform was enacted by an amendment to the 2001 agreement: it was not the result of routine bargaining, which is scheduled long ahead of time. The reform was announced during Christmas holidays and implemented just 10 days later; hence, neither employees nor employers could take measures ahead of time in anticipation of the reform. Once the new rules were in place, the only point the employees could negotiate was a deferral of the termination date, in response to the new rules.

Unemployed workers may be eligible for short, medium, or long term benefits. UI rules that determine PBD differentiated entitlement categories ("filières") on the basis of several criteria: ER, age, contributions to the pension system (see Table 1). The ER required for different lengths of PBD did not change over the period under consideration (2001–2005) for the entitlement categories described in Table 1 (medium and long-term benefits). Hence it makes sense to compare UI admissions under 2001 rules with UI admissions under 2003 rules. The effect of a change in benefit duration alone, with other UI parameters remaining unchanged, can be evaluated. In particular, potential selection effects cannot be connected to changes in ER criteria. This is not the case for entitlement categories which require shorter employment records (and offer short-term benefits); hence they are excluded from the analysis. In the rest of this paper, only entitlement categories that require at least 14 months of ER over the previous 2 years are considered.

All of the entitlement categories except category B involve an age requirement. When considering entitlement categories that may concern older workers, it is convenient to simply distinguish between an intermediate ER (categories 6 and B) and a long ER (categories 7, 8, C and D).[6] A long ER refers to more than 27 months of employment over the 3 calendar years prior to job loss while an intermediate ER refers to less than 27 months over the 3 calendar years prior to job loss but more than 14 months over 2 calendar years. Within the framework of a dual labor market, most older workers with a long ER had a continuous work history before losing their jobs. Those with an intermediate ER had a more discontinuous recent work history.

The main effect of the 2003 reform is a sharp decrease in PBD for all the entitlement categories considered. For job losses occurring after January 1, 2003 rather than before, there is a 22 month reduction of PBD for older workers with an intermediate ER. The reduction is even sharper – 24 months – for workers with a long ER who contributed for more than 100 quarters to the pension system but who were less than 57 years old. As Table 1 shows, age at the date of job termination plays a major role in determining PBD for older workers.

3.4. Incentives linked to institutions and policies

The critical age thresholds and incentives that emerge from UI and pension rules are described here. Obviously, other policies that involve age thresholds could induce specific incentives for the management of the older workforce: industry specific severance pay rules, taxes on layoffs of older workers, exemption from the job search obligation, active employment policies, etc. (see Appendix C). The important point is that none of these policies changed over the period under study. It is thus possible to attribute changes in inflow age patterns to the UI reform.

Age thresholds related to UI are of particular importance. In fact, before workers reach 160 quarters of contributions to the pension system, they have a clear incentive to draw UI benefits rather than a pension because otherwise a discount is applied to the amount of the statutory pension. Furthermore, UI benefits are considerably higher than UA benefits for the majority of unemployed workers (see Fig. 1).

Figs. 2 and 3 depict the relationship between the age of a worker at the date of job termination and PBD depending on whether the worker's ER is intermediate or long, before and after the reform. Crossing an age

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[6] Entitlement category 6′ groups together claimants that would have been classified in entitlement category 6, 7 or 8 if their employment contracts had ended before June 30, 2002. Hence, within entitlement category 6′, an intermediate ER cannot be distinguished from a long ER. This issue comes up again below.
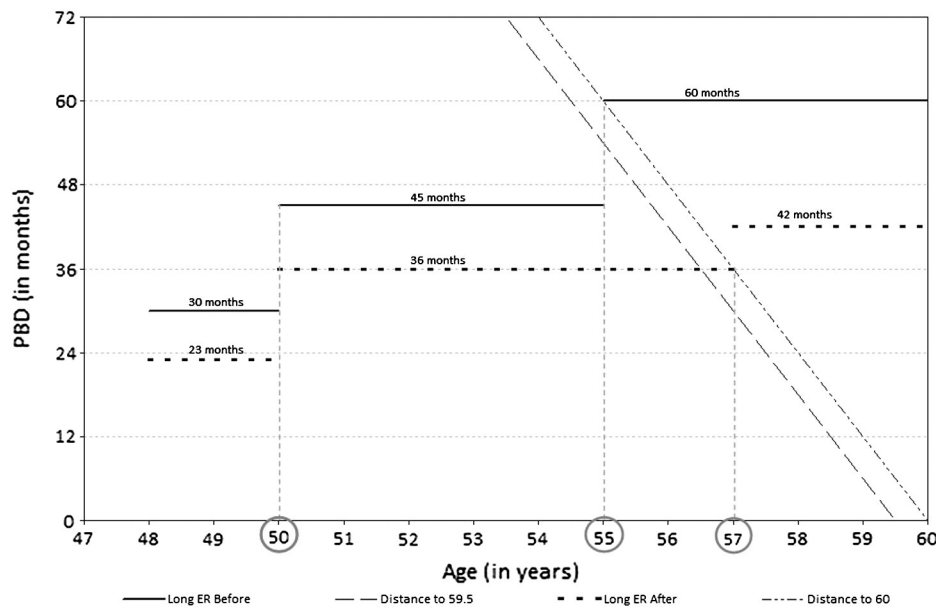
Fig. 2. PBD for a long ER, before and after the reform.

threshold may entitle workers to longer PBD. Before the reform, being just above age 50 (rather than just below) resulted in a 15 month increase in PBD (45 months instead of 30) for unemployed workers with a long or an intermediate ER; being just above age 55 resulted in a 15 month increase in PBD (60 months instead of 45) for those with a long ER. After the reform, being above age 50 makes a difference only for workers with a long ER while the threshold of age 55 is no longer critical in terms of PBD. If a worker with a long ER has contributed long enough to the pension system, being just above age 57 increases PBD.

Crossing an age threshold may allow workers to rely on UI to provide incomes until retirement. This depends on the rules that apply to the transition from compensated unemployment to the pension system. Throughout the period under study, the general rule was that any worker over 60 with at least 160 quarters of contributions to the pension system could retire with a full pension. Once these conditions were fulfilled, eligibility for UI ceased. The statutory pension age is critical even for people whose pension contribution record is below 160 quarters. Indeed, if workers have contributed to the pension system for 100 quarters, and if their UI admission dates back at least 1 year, and if they satisfy an ER requirement that is not very restrictive (one continuous year or two discontinuous years of employment over the 5 years prior to unemployment), their UI benefits last until they are entitled to a full retirement pension. The PBD does not apply![7] The minimum age to qualify for this extension of UI benefits was 59.5 before the reform and 60 after. For this reason, the January 2003 PBD reductions should be assessed in terms of the distance to age 60 and PBD before the reform should be assessed in terms of the distance to age 59.5 (represented by slanted lines in Figs. 2 and 3). Before the reform, a worker who lost a job at age 55 was entitled to 60 months of UI benefits and hence could expect to receive UI benefits until age 60 and thereafter until entitlement to a full pension since UI benefits duration became unlimited once the claimant reached age 59.5. This was no longer possible before age 57 after the reform. In that light, the 6 extra months (42 months instead of 36) for workers age 57 and over (2003 entitlement category D) seems somewhat formal since 36 months is enough to qualify for unlimited entitlement duration. From this perspective, for an intermediate ER, two more age thresholds may be important: 55.75 before the reform and 58.08 after the reform. These thresholds

differ from those mentioned above. What is crucial here is not entitlement to longer PBD but bridging the gap until eligibility for an old age pension. This is an issue of distance to retirement. These thresholds may be critical because an unemployed worker who is no longer compensated at age 59 cannot become eligible for an extension of UI benefits until retirement and hence can only get UA or welfare with much lower benefits in most cases (see Fig. 1).

Are all these age thresholds relevant to understanding behaviors in the labor market? If some of them prove relevant, what is the nature of their influence? Is it a matter of a pure "entitlement" effect, i.e. a desire to offer dismissed workers the most favorable terms for seeking a new job? Is it a matter of distance to retirement, i.e. disguised early retirements? These are some of the questions investigated below. Special attention is given to the specific age thresholds identified above, which are important in terms of entitlement and/or distance to retirement. For long ER: 50 and 55 before the reform; 50 and 57 after the reform. For intermediate ER: 50 and 55.75 before the reform; 58 after the reform.

In the next sections, we try to determine if there are specific behaviors regarding management of the older workforce at specific age intervals and whether these behaviors are consistent with the incentives presented above. The match of behaviors to UI incentives is expected to be better: when the incentives are stronger (workers who have the opportunity to get unemployment compensation until retirement, workers with high wages for whom the gap between UI and UA is the wider); for employees who have a stronger bargaining power (workers with high wages, long tenure and thus a long ER, who have lost their jobs due to dismissal).

4. Data and descriptive analysis of age patterns of UI inflow

4.1. The baseline sample

The analysis relies on a 1/10th random extraction from all unemployment benefit records of the French Employment Agency (segment D3 - FHS, Pôle emploi, Dares) over the period 2001–2010. Each observation is a continuous spell during which an individual is entitled to an unemployment benefit.[8] This baseline data set is enriched with individual sociodemographic information from the registry of job seekers, as well

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[7] According to Unédic (quoted in OECD, 2014), this scheme involved 40,000 unemployed workers in 2011, for a total cost equal to 3% of the total amount of benefits.

[8] The French Ministry of Labor deals with obvious registration errors in the raw dataset.
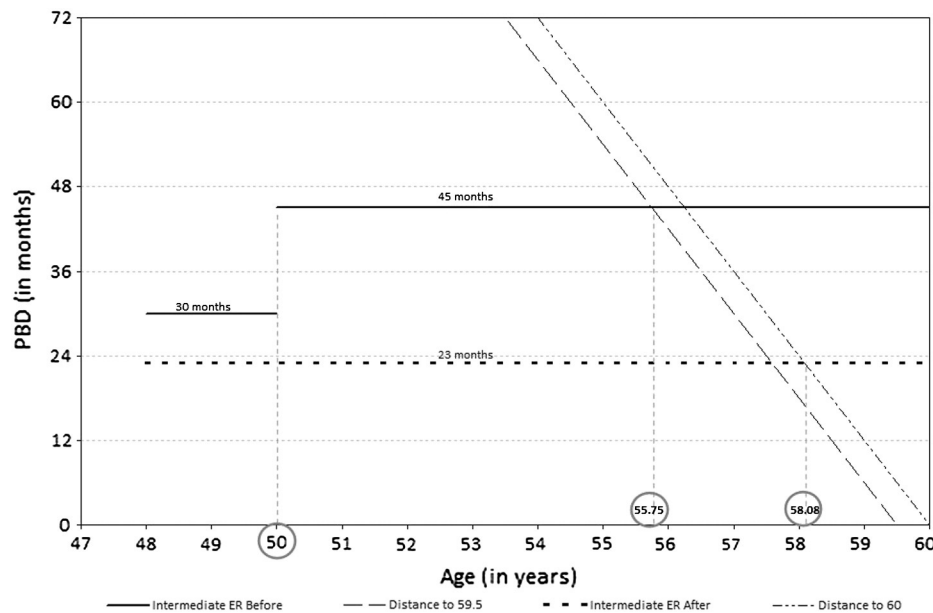
Fig. 3. PBD for an intermediate ER, before and after the reform.

as with the corresponding category of employment contract termination. The baseline sample includes the following types of UI admissions:

- Admissions corresponding to full entitlement, i.e. which do not correspond to residual entitlement from a previous admission[9]; entitlement is based on the most recent contract termination to date;
- Admissions corresponding to the *standard* UI benefit (called "ARE, Allocation d'aide au retour à l'emploi");
- Admissions occurring between January 1, 2001 and December 31, 2005, which are covered by 2001 and 2003 UI agreements;
- Admissions corresponding to *regular* UI rules, which eliminates workers on temporary assignment and temporary workers from the entertainment industry, as well as any other occupations subject to special UI rules.

The baseline sample contains 111,449 UI admissions of workers age 45 or more at the date of admission.

4.2. The baseline evidence

To conduct the analysis, the 45–60 age range was split into 60 quarter-long age groups from 45.00–45.24 to 59.75–59.99.[10] Fig. 4 depicts the age pattern of average annual UI inflow before and after 2003, the year of the reform: the period before, 2001–2002, is shown in gray; the period after, 2004–2005, is shown in black.

For the 2001–2002 period, the age-profile of UI inflow exhibits a discernible jump at age 50, with a slight decreasing trend both below and above this threshold. A huge jump is observed at 55 with a fall in admissions just below that age and a peak just above (a "hole-below/peak-above" pattern). Beyond the 55.00–55.24 peak, there are fewer and fewer admissions with a slight rise at ages 57 and 58. Beyond age 58, most older workers move directly from employment to retirement without going through a period of unemployment.[11]

Total 2004–2005 UI inflow is larger than that of 2001–2002 and the age pattern changes considerably. Below the age 50 threshold, a slight

decreasing trend is still discernible but the number of admissions now seems to be aligned with that observed over the age range from 50 to just below 55. The magnitude of the "hole-below/peak-above" pattern at 55 is much attenuated, while a peak in admissions now appears just above 57. Beyond this threshold, admissions gradually decrease with a slope similar to that which prevailed over the 2001–2002 period but at a higher level.

Although Fig. 4 suggests that UI rules influence behaviors, some factors that have nothing to do with these rules may determine the UI inflow age pattern. Among them, factors related to the employment adjustment process are likely to be of primary importance.

4.3. The underlying employment adjustment process

Fig. 5 illustrates the *employment adjustment process* at work over the period under study. It presents quarterly changes in private non-farm payroll employment (left hand scale) as well as detailed changes for the construction and manufacturing industries (right hand scale) from 1997 to the end of 2010. Vertical lines indicate the years covered by the period under study; the third line corresponds to the date of the reform.

The period 2001–2005 followed a phase of strong employment growth. As regards UI, this means that workers who lost their jobs over this period had more opportunities to get permanent contracts and a long ER. Thus, the period starts with an unusually high share of insiders. The UI coverage rate for the unemployed is at its highest level. A turning point comes in 2001: overall employment growth slows and job losses start in the manufacturing sector, a trend which persists all through the rest of the period. In 2002Q3, job losses spread to other sectors. Over the period 2001–2005, it is possible that some of the differences previously highlighted between UI inflow age patterns in 2001–2002 and in 2004–2005 are actually imputable to the underlying employment adjustment process rather than to UI rules.[12] An ideal comparison would require that both subperiods (before/after) correspond to a similar phase of employment adjustment. The econometric analysis conducted below deals with this issue.

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[9] An unemployed person who finds a job before PBD runs out retains a residual entitlement. In case of subsequent job loss, the new entitlement duration is based on whichever is greater, this residual entitlement or the PBD resulting from the ER concerning the last job to date.

[10] 3184 admissions of workers older than 60 are discarded here.

[11] There is no rise above age 60: the decline of inflow continues with a slight drop at 60.

[12] The 2001–2002 period initiates the labor productivity cycle whereas the 2004–2005 period ends it: if different stages of employment adjustment have different impacts on the age pattern of UI inflow, attributing observed changes to UI rules would be incorrect.
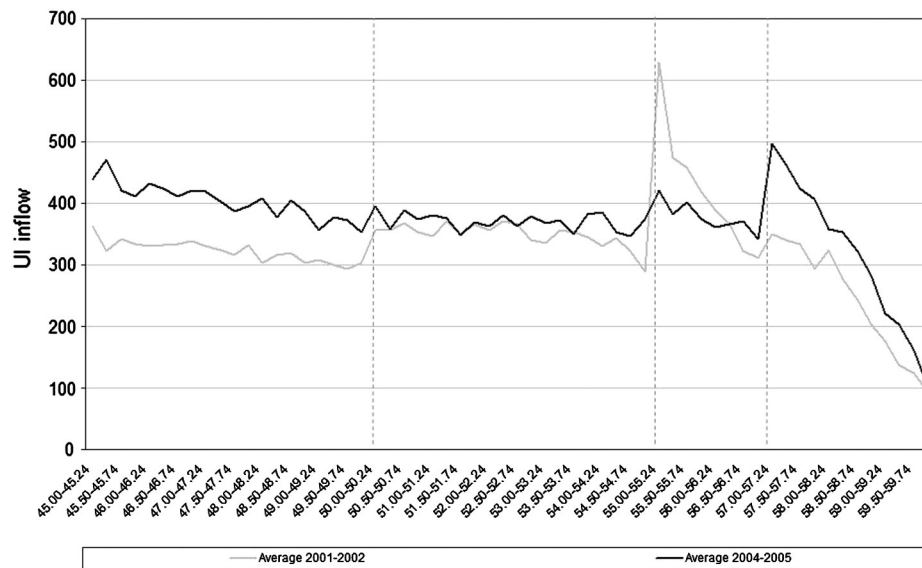
Fig. 4. Average annual UI inflow of workers aged 45 to 60 before and after the reform.

5. Econometric analysis of age patterns of UI inflow

Our approach is the same as that of Tuit and van Ours (2010). Our aim is to analyze UI inflow age patterns so as to distinguish: (1) what is due to the underlying employment adjustment process; (2) what is due to UI rules before the reform; (3) what is due to the reform. To do this, each UI inflow age group is split again by calendar quarter from 2001Q1 to 2005Q4. The inflow of workers in the quarterly age group number $\tau \in \{1,\dots,60\}$ entering UI in quarter number $t \in \{1,\dots,20\}$ is denoted $y_{t,\tau}$. The baseline analysis is thus conducted over 1200 observations = 20 calendar quarters × 60 quarterly age groups.

Two complementary specifications are considered: the first makes no assumption as to quarterly age groups involving discontinuities (comprehensive analysis); the second focuses on particular age thresholds (targeted analysis). The first specification requires observations for each quarter × age-group combination whereas the second can be estimated with missing age group values. The former is particularly useful

for detecting relevant age thresholds; the latter is particularly useful for conducting the analysis over subsamples (stratification).

5.1. Comprehensive analysis

First, a comprehensive analysis is conducted in order to see at which age thresholds some marks of specific workforce management practices can be observed. Denoting b_t a "before-the-reform" dummy (taking value one for t below January 1, 2003), the estimated equation is

$$\log y_{t,\tau} = \log y_0 + \alpha_t + \beta_\tau + \delta_\tau \cdot (1-b_t) + \varepsilon_{t,\tau} \qquad (1)$$

where parameters α_t capture calendar-quarter fixed effects ($t = 1,\dots, 5,7,\dots,20$), β_τ age group fixed effects, and δ_τ the before–after difference for age group τ ($\tau = 1,\dots,28,30,\dots,60$); error terms $\varepsilon_{t,\tau}$ are assumed to be independent and identically distributed. The intercept $\log y_0$ corresponds to the UI inflow of the reference calendar-quarter × age-
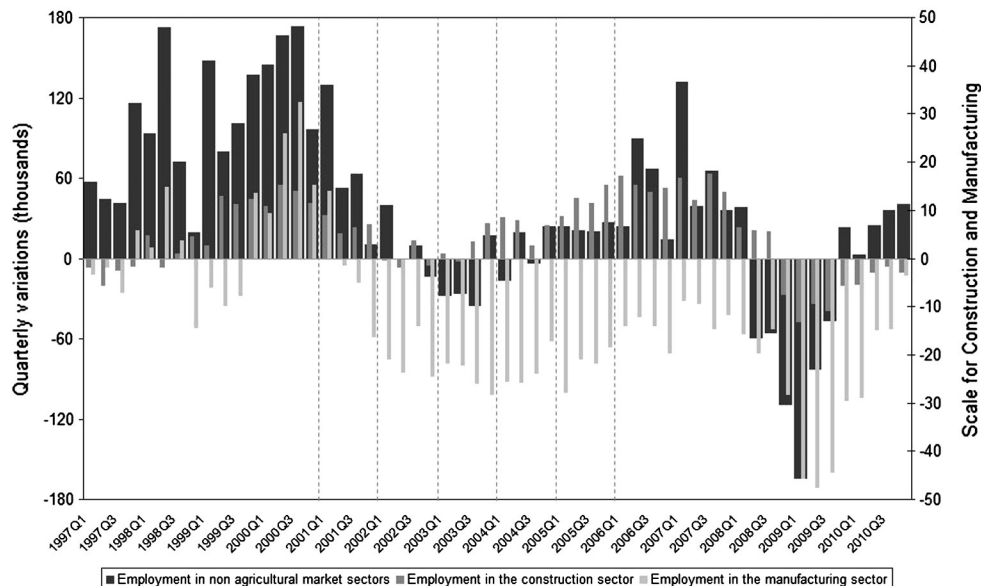

Fig. 5. Private non-farm payroll employment variations 1997–2010, Insee.
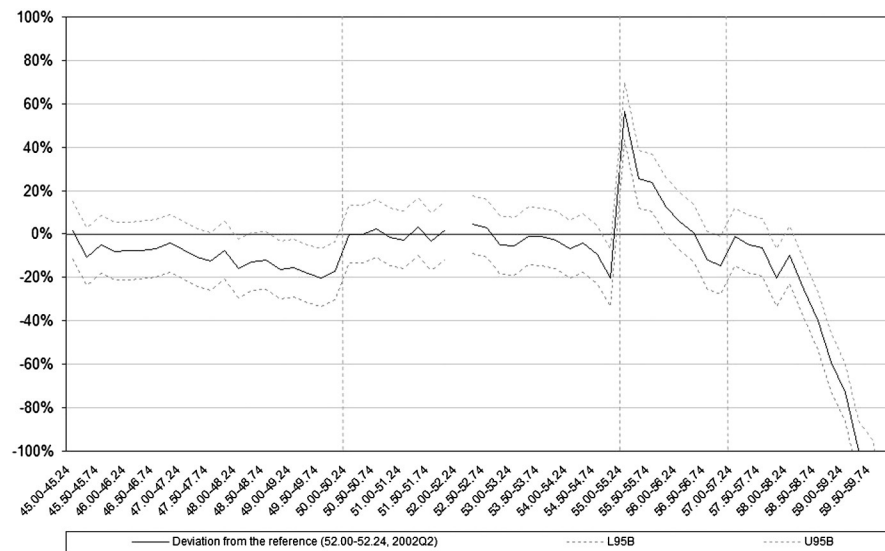
Fig. 6. UI inflow, deviation from the reference (52.00–52.24, 2002Q2) controlling for quarter fixed effects and before–after differences — baseline sample, beta estimates.

group. For the estimation presented below, the reference is the 2002Q2 inflow of workers aged 52.00–52.24 which represents 77 individuals.[13] Model 1 is estimated by using OLS.

To test whether the results are sensitive to the choice of a breaking date,[14] two possible dates are considered: January 1, 2003, and July 1, 2003. Estimation results are presented in Figs. 6 and 7; Table 2 details some corresponding interesting estimates.

5.1.1. UI inflow age pattern assuming no reform

Beta parameter estimates of specification 1 are presented in Fig. 6 (and Table 2, third column). Controlling for the employment adjustment cycle,[15] it depicts the age pattern of UI inflow that would have been observed, had no reform occurred over the period.

Fig. 6 basically confirms the descriptive analysis. Most significant (at the 5% to 1% level) deviations from the reference are consistent with "before-the-reform" age-related UI incentives. Some admissions of workers below age 50 seem to be postponed: this is at odds with incentives provided by the "Delalande" tax on older workers' job terminations,[16] but it is consistent with PBD incentives (see Fig. 2 and 3, before the reform). Similar behaviors are observable at 55, with deviations of a much stronger magnitude: admissions are 20% lower than the reference just below 55, and 57% higher just above. The number of admissions is also significantly lower than the reference just below ages 57 and 58 and it is close to the reference just above those ages. These age thresholds are considered in more detail below.

5.1.2. Before\after differences

What did the January 2003 reform in UI rules change? Delta parameters of model 1 are now considered; estimates are presented in Fig. 7 (and Table 2, fourth column). It depicts the before/after change that is

strictly imputable to the change in rules which occurred on January 1, 2003 (after controlling for the employment adjustment process).

First of all, there is no significant change over the range from age 50 to just below age 55 in the number of admissions. This is important for the quantification strategy presented in the last part of this study.

There are large changes for other age intervals.

- First, the number of UI admissions among workers below age 50 lines up with that of workers age 50–55. This may reflect a change in incentives as regards *intermediate ER*: being over 50 no longer makes a difference for workers with an intermediate ER (see Figs. 2 and 3).
- Second, the number of admissions just below age 55 is almost 20% higher after the reform than before, whereas admissions just above age 55 are more than 30% lower: the reform led to a smoothing of the 55 "hole-below/peak-above" pattern previously observed.
- Third, the latter finding goes along with a significant change at 57. After the reform, the inflow just above age 57 is 30% higher than before (and 21% higher for the next quarterly age group).

Beyond age 57, the number of admissions increases after the reform for most age-groups. Hence, controlling for the underlying employment adjustment process confirms the description provided in Fig. 4. In particular, the high number of admissions occurring between ages 55 and 57 before the reform seem to be displaced above age 57 after the reform.

A remarkable point is that PBD incentives of similar magnitude lead to very different responses at different critical age thresholds. Before the reform, the age 50 threshold results in a shift in level, but not to the "hole-below/peak-above" pattern that characterizes the age 55 threshold. This might be due to the fact that only an entitlement incentive is at work at age 50, whereas two incentives overlap at age 55 for workers with a long ER: an entitlement incentive plus the possibility of receiving benefits until eligibility for a full pension, that is, a "distance-to-retirement" incentive. The displacement of the spike to age 57 after the reform could be due to the same factor: this age threshold also combines both incentives. From this perspective, the "peak-above" pattern observed above 55 and 57 deserves consideration: in terms of entitlement, there is no particular reason to enter UI just above age 55 rather than later on. It seems that some employers seek to reduce their older workforce *as soon as* "acceptable" terms for retiring are available, at least for workers with a long ER.

Finally, defining the date of the break in rules as July 2003 (Table 2, two last columns) rather than January 2003 does not change the general

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[13] Three concerns motivate this choice: first, it corresponds to an inflow that is very close to the average (see the estimated intercept, Table 2); second, it is a turning point as regards the employment adjustment process (see Fig. 5); third, as Fig. 4 shows, the gross before–after difference is almost zero for this age group.

[14] Adjustment of workforce management practices to new UI rules may indeed take some time. Another reason for this test is that only the date of UI admission is available in the data and not the date of job termination which actually conditions assignment to 2001 rules or 2003 rules. In practice, the two dates are rarely separated by more than a few weeks.

[15] Controlling for calendar-quarter fixed effects is useful most notably for quarters 2001Q1, 2001Q2, 2001Q3, 2002Q1, 2002Q3, 2002Q4, 2003Q1.

[16] And consistent with the finding (Behaghel et al., 2008) that firms' decisions to lay off workers were non-affected by the Delalande tax.
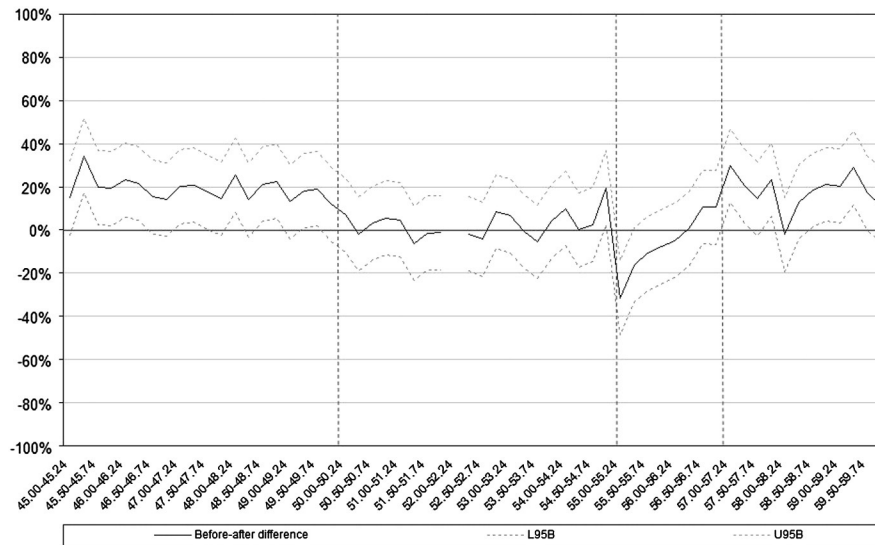
Fig. 7. UI inflow, before–after differences controlling for age group and quarter fixed effects — baseline sample, delta estimates.

picture: estimates are not very sensitive to the choice of a reform break date, which suggests that employer and employee behaviors adjust quite quickly to new UI rules.[17]

The comprehensive analysis provides clear evidence of behavioral responses at ages consistent with UI incentives. To further investigate the mechanisms and segments of the workforce which drive these responses, targeted analyses are conducted. We test, at given ages, for the existence of "hole-below" patterns and/or "peak-above" patterns.

5.2. Targeted analysis

To refine interpretation of previous findings, an approach that is less demanding (as regards the distribution of UI admissions by age group and calendar-quarter) than the comprehensive one is adopted. The idea is to measure deviations near a restricted set of age thresholds identified as potentially critical (in the incentives analysis of Section 3.4, or in the comprehensive analysis). Aiming to measure deviations from the age trend at threshold ages as

$$
\log y_{t,\tau} = \log y_0 + \alpha_t + \gamma \cdot \tau \\
+ \sum_{age} \left(\begin{matrix} \left(\zeta_{age}^b \cdot q_{<age} + \eta_{age}^b \cdot q_{\geq age} \right) b_t \\ + \left(\zeta_{age}^a \cdot q_{<age} + \eta_{age}^a \cdot q_{\geq age} \right) (1 - b_t) \end{matrix} \right) + \varepsilon_{t,\tau} \quad (2)
$$

Denoting $\log y_0$ the intercept and keeping 2002Q2 as the calendar-quarter of reference, parameters α_t still capture quarter fixed effects while γ captures an age trend; estimated deviations are compared to this trend.[18] The parameters of interest are those associated with each of the pairs of dummies $(q_{<age}, q_{\geq age})$ defined as

$$
q_{<age} = \begin{cases} 1 & \text{for the quarterly age class just below the threshold } age \\ 0 & \text{otherwise} \end{cases}
$$
$$
q_{\geq age} = \begin{cases} 1 & \text{for the quarterly age class just above the threshold } age \\ 0 & \text{otherwise} \end{cases}
$$

Parameters ζ_{age} check for a deviation from the trend for the quarterly age group just below the threshold age while η_{age} check for a deviation just above the same threshold. Parameters (ζ^b, η^b) provide "before

the reform" measurements while (ζ^a, η^a) provide "after the reform" measurements. Error terms $\varepsilon_{t,\tau}$ are assumed to be independent and identically distributed. Model 2 still tests for "hole-below/peak-above" patterns, that is, the fact that the number of admissions is significantly lower than the trend just below the threshold age and/or higher just above. Model 2 is estimated by using OLS over the age range 49.00–58.99 (rather than 45.00–59.99 as in the comprehensive analysis): this is designed to limit the impact of extreme age groups on the estimated age-trend which is now the reference compared to which deviations are measured. The analysis is thus conducted over 800 observations (20 calendar quarters × 40 quarterly age groups).

Model 2 is repeatedly used in the next four steps. In the first step, we show that the results obtained with this new specification are consistent with those of the comprehensive analysis and we consider together inflows and their content in terms of mean wage. In the second step, the analysis is stratified by employment records (long or intermediate), which drive different age incentives (see Section 3.4). In the third step, various job termination categories are considered. The fourth step of the analysis combines the last two and completes an interpretation based on an "insider/outsider" scenario.

5.2.1. Inflows and wages

The targeted analysis is conducted in parallel on UI inflows (y) and mean wages (w) within each age group. As regards mean wages, the specification is that of model 2, only the dependent variable changes: it is the logarithm of the "reference daily wage" (in €) paid to workers during the year preceding their employment termination. This is the amount taken into account in the calculation of UI benefits. As illustrated previously (Fig. 1), the UI benefit is an increasing function of a worker's wage before job termination: the higher the wage at the time of job termination, the wider the gap between the amounts of UI and UA benefits, the stronger the incentives associated with UI rules, and probably the stronger the power of the worker to negotiate an exit at the right age-interval so as to get UI benefits until retirement.

Results are presented in Table 3. The issue, regarding UI inflows, is to note that estimates are consistent with those of the comprehensive analysis: estimates using the same reference are indeed remarkably similar.[19] Before the reform, the biggest jump in inflow occurs at 55,

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[17] Another variant (not reported here) has been considered. It consists of setting the reform break in January 2004, and it also leaves estimates virtually unchanged.

[18] Similar models with quadratic specifications of the age-trend have been estimated: results are the same and available upon request from the authors. The linear specification is preferred here to allow comparison to Tuit and van Ours (2010).

[19] On the one hand, beta's estimates from the first specification are compared to the "before" estimates from the second specification; on the other hand, beta + delta estimates from the first specification are compared to the "after" estimates from the second specification

Table 2
Comprehensive analysis (model 1), reform break on January 2003 (left) or July 2003 (right), main OLS estimates, baseline sample.

| | | log y | | log y | |
| | | January 2003 | | July 2003 | |
τ	Age class	$\hat{\beta}_\tau$	$\hat{\delta}_\tau$	$\hat{\beta}_\tau$	$\hat{\delta}_\tau$
19	49.50–49.74	−.20***	+.19**	−.18***	+.18**
20	49.75–49.99	−.17***	+.12	−.15**	+.10
21	50.00–50.24	−.00	+.07	−.02	+.05
40	54.75–54.99	−.20***	+.19**	−.16***	+.15*
41	55.00–55.24	+.57***	−.31***	+.58***	−.41***
42	55.25–55.49	+.25***	−.16***	+.28***	−.25***
43	55.50–55.74	+.24***	−.11	+.25***	−.16*
44	55.75–55.99	+.12*	−.08	+.15**	−.14
45	56.00–56.24	+.06	−.05	+.09	−.12
46	56.25–56.49	+.00	+.01	+.03	−.05
47	56.50–56.74	+.12*	+.11	−.09	+.07
48	56.75–56.99	−.14**	+.11	−.09	+.02
49	57.00–57.24	−.01	+.30***	+.04	+.25***
50	57.25–57.49	−.05	+.21***	−.04	+.24***
51	57.50–57.74	−.06	+.14*	−.06	+.18**
52	57.75–57.99	−.20***	+.23***	−.18***	+.25***
53	58.00–58.24	−.10	+.02	−.10*	−.01
54	58.25–58.49	−.25***	+.13	−.25***	+.15*
55	58.50–58.74	−.40***	+.19**	−.40***	+.22***
56	58.75–58.99	−.59***	+.21**	−.58***	+.23***

$N = 1,200$
$R^2_{adj} = .83$
$\overline{\log y} = 4.46$
$\log y_0 = 4.51^{***}$

$N = 1,200$
$R^2_{adj} = .84$
$\overline{\log y} = 4.46$
$\log y_0 = 4.49^{***}$

Significant at ***1%, **5%, *10%.

Table 3
Targeted analysis (model 2), UI inflow (left) and mean wage (right), OLS estimates.

| | | log y | | log w | |
| Reform break | | January 2003 | | January 2003 | |
Age thresholds		Before	After	Before	After
50.00	$\hat{\zeta}$	−.16***(.06)	−.09*(.05)	+.01(.03)	+.07***(.03)
	$\hat{\eta}$	+.02(.06)	+.04(.05)	+.07**(.03)	+.09***(.03)
55.00	$\hat{\zeta}$	−.12**(.06)	+.03(.05)	−.16***(.03)	−.04*(.03)
	$\hat{\eta}$	+.65***(.06)	+.29***(.05)	+.09***(.03)	+.05*(.03)
55.75	$\hat{\zeta}$	+.33***(.06)	+.17***(.05)	+.06*(.03)	−.02(.03)
	$\hat{\eta}$	+.22***(.06)	+.09**(.05)	−.00(.03)	+.03(.03)
57.00	$\hat{\zeta}$	−.03(.06)	+.02(.05)	+.09***(.03)	−.07**(.03)
	$\hat{\eta}$	+.10*(.06)	+.35***(.05)	+.07**(.03)	+.13***(.03)
58.00	$\hat{\zeta}$	−.07(.06)	+.11**(.05)	+.07**(.03)	+.02(.03)
	$\hat{\eta}$	+.03(.06)	−.04(.05)	+.02(.03)	+.07**(.03)
	$\hat{\gamma}$ −.0035 ***(.0006)			−.0087 ***(.0003)	

$N = 800$
$R^2_{adj} = .48$
$\overline{\log y} = 4.50$
$\log y_0 = 4.58^{***}$

$N = 800$
$R^2_{adj} = .59$
$\overline{\log w} = 4.15$
$\log w_0 = 3.88^{***}$

Standard errors in parentheses. Significant at ***1%, **5%, *10%.

while no hole-below/peak-above pattern appears at 57. After the reform, the jump at 55 is greatly attenuated whereas a peak-above pattern appears at 57. The parallel analysis of the age pattern of mean wages (depicted in Table 3, right columns) yields an initial insight into what these findings mean. The fact that the targeted analysis captures deviations from an age-trend is particularly relevant as regards the mean wage pattern, since a positive trend is expected a priori. Up to age 55, mean wages among workers admitted to UI increase slightly, as expected. A hole-below/peak-above pattern is salient at 55 before the reform and at 57 after the reform. The interesting thing is that a jump is observed at 55 before the reform and at 57 after the reform, i.e. the same thresholds just above which a peak is observed in the number of admissions.[20] Comparison with the findings of Tuit and van Ours (2010) is particularly relevant here: the period under study is broadly the same and our results are remarkably similar, although we consider a wider age range. Tuit and van Ours point to a spike in unemployment inflow at age 57.5 (the age threshold consistent with UI incentives in The Netherlands) that vanishes after the reform. They also find a higher share of high wage workers at the inflow spike.

These observations on wages can be interpreted as due to stronger bargaining power among high wage workers; it could also be linked to the fact that high wage workers have stronger incentives for obtaining compensation until retirement. The next step is to clarify the interpretation of previous findings by replicating the targeted analysis for relevant subsamples and taking a closer look at the issue of bargaining power and differences in workforce management practices when dealing with insiders or outsiders. The targeted analysis is conducted as before by stratifying first by length of ER (intermediate or long) and then by legal category of job termination.

5.2.2. Stratification by ER

The length of ER is crucial here since, as Figs. 2 and 3 show, it determines PBD, and hence incentives. It is thus of particular interest to test whether the magnitude of the effects is the same for both ER groups at their specific age thresholds.

Stratification by ER entails further restrictions on the baseline sample. First, since the distinction between an intermediate and a long ER only holds for workers over age 50 at the date of dismissal (see Table 1), the analysis has to be restricted to workers over 50 and so the 50 year old age threshold cannot be considered. Second, to guarantee control for selection effects, UI admissions under the July 2002 transitory rules (see Table 1) must be discarded. As a consequence, the analysis is restricted to comparison of admissions under 2001 rules until June 30, 2002, with admissions under 2003 rules from January 1, 2003 to the end of 2005.[21] Results are presented in Table 4.

As regards an intermediate ER, a "distance-to-retirement" effect should result in a hole just below age 55.75 and/or a peak just above, before the reform, and a hole just below age 58.00 and/or a peak just above, after the reform.[22] Such evidence does not appear clearly at this stage. Before the reform, a small spike is observable just above age 55; this vanishes after the reform, while a peak arises just below age 58. This is intriguing since, at these ages, PBD is not supposed to be quite long enough to reach the minimal age (59.5) at which people can receive unemployment benefits until retirement. To get an insight into what is going on, we have considered variations in the fraction of the unemployed who were eventually exempted from job search (which involves being eligible for compensation until retirement, see Appendix C). We carried out the same targeted analysis.[23] Before the reform, a significant peak in this fraction is observable just above age 55; after the reform, the fraction at age 55 is actually lower than the trend both just below and above age 55, while a peak arises just below age 58. This suggests that some workers with an intermediate ER who started getting UI compensation "too young"[24] were in fact able to receive benefits until retirement. There could have been a delay between

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[20] This is part of the reason why the weight of older unemployed workers in UI expenditures is much greater than their statistical weight within the population of unemployed workers as a whole.

[21] Since the resulting age-range is 50.00–58.99, the potential number of cells with observations is 648 (18 quarters × 36 quarterly-age groups) but one quarter-age group combination is missing for the intermediate ER subsample.

[22] Crossing these age thresholds does not entitle these workers to longer PBD, but it does allow them to be compensated until they are eligible for a full rate pension.

[23] Results are not reported but available upon request.

[24] "Too young" compared to the time until retirement.

their date of admission and the date of the first payment of UI benefits.[25] 55.00 and 57.75 (rather than 55.75 and 58.00) seem to be the relevant age thresholds to test for a distance-to-retirement effect for workers with an intermediate ER.

Evidence of incentive effects of UI rules on inflow age patterns is more direct for workers with a long ER. We would expect to find the following: a hole just below age 55 and/or a peak just above age 55, before the reform; a hole just below age 57 and/or a peak just above, after the reform. That is exactly what we observe. Before the reform, the inflow of workers with a long ER just below 55 was 12% lower than the trend, whereas that of workers just above age 55 was 80% higher! After the reform, although the inflow of workers with a long ER is not significantly different from the trend below age 57, that of workers just above age 57 is 42% higher.

And yet, results in Table 4 suggest that factors other than PBD are at work. Although, before the reform, no PBD incentive exists at age 57, the inflow of workers just above age 57 is 23% higher than the trend; a similar observation can be made as regards the 55 age threshold since the inflow of workers just above age 55 remains 24% higher than the trend after the reform. This points toward something that did not change on January 1, 2003, namely age thresholds for exemption from job search requirements, which are age 55 for workers with more than 160 quarters of contributions to the pension system, and 57.5 for others (see Appendix C). If this interpretation is correct, before the reform, the job search exemption incentive accounts for less than one quarter of the jump in the number of admissions at age 55 and for almost one half of the jump at age 57. It should be noted that no characteristic inflow pattern is observable at ages 55.75 or 58 which are not critical for workers with a long ER.

From this stratified analysis by ER, it appears that not only do UI inflow age patterns differ between intermediate and long ER, but also these patterns are, to a large extent, consistent with corresponding age incentives. However, the spikes identified in the case of a long ER are of much greater magnitude. Is it because the incentives are stronger for those with a long ER? In fact, the thresholds of age 55 before the reform and of age 57 after the reform correspond to the combination of an entitlement effect and a distance-to-retirement effect. However perhaps we are observing evidence of two different workforce management models, one for insiders and one for outsiders? Or we may be seeing evidence of differences in employee bargaining power? To further explore these issues, we conduct a stratified analysis by job termination category.

5.2.3. Stratification by job termination category

Before considering the results of this alternative stratification, one should highlight that ER and termination categories are not independent. Table 5 describes the subsample of workers age 50 or more at UI admission for whom both the termination category and the ER are available.[26] Table 5 distinguishes three periods corresponding to the three successive sets of UI rules mentioned in Table 1. The distribution of UI admissions suggests that some termination categories are good predictors for ER. Before July 1, 2002, among workers who lost their jobs due to economic redundancy, the probability of being admitted to UI with a long ER is 86%; the probability is 91% under 2003 rules. Probabilities are of similar magnitude concerning layoffs for personal reasons.

Because of these correlations, behaviors close to those observed for long ERs are expected for dismissed workers (economic redundancy or layoff for personal reasons) and results close to those observed for

Table 4
Targeted analysis (model 2) stratified by ER class, OLS estimates.

Age thresholds		Intermediate ER		Long ER	
		Before	After	Before	After
55.00	$\hat{\zeta}$	+.19(.13)	+.05(.09)	−.12*(.07)	+.03(.05)
	$\hat{\eta}$	+.37***(.13)	+.06(.09)	+.80***(.07)	+.24***(.05)
55.75	$\hat{\zeta}$	+.11(.13)	+.24***(.09)	+.44***(.07)	+.12**(.05)
	$\hat{\eta}$	+.14(.13)	+.07(.09)	+.28***(.07)	+.04(.05)
57.00	$\hat{\zeta}$	−.02(.13)	+.18*(.09)	+.08(.08)	+.00(.05)
	$\hat{\eta}$	−.11(.13)	+.07(.09)	+.23***(.08)	+.42***(.05)
58.00	$\hat{\zeta}$	−.20(.13)	+.24**(.10)	+.01(.08)	+.11**(.05)
	$\hat{\eta}$	+.13(.13)	−.04(.10)	+.12(.08)	−.04(.05)
	$\hat{\gamma}$	−.044***(.001)		.006***(.001)	
		$N = 647$		$N = 648$	
		$R^2_{adj} = .68$		$R^2_{adj} = .59$	
		$\overline{\log y} = 2.57$		$\overline{\log y} = 4.12$	
		$\log y_0 = 4.25***$		$\log y_0 = 3.89***$	

Standard errors in parentheses. Significant at ***1%, **5%, *10%.

intermediate ERs are excepted for terminations due to "end of a fixed-term contract" and for terminations classified as "other". Stratification by job termination category is further interesting for two reasons. First, although it entails its own sample restrictions, these restrictions are orthogonal to those described for stratification by ER category[27]: since both ER and termination categories capture the same underlying insider/outsider divide, the two approaches are complementary. Second, the job termination category captures more direct information about workforce management patterns and the balance of bargaining power between the worker and the employer, and is therefore useful in understanding the behaviors driving UI inflow age patterns.[28]

The targeted analysis is conducted separately for four job termination categories: layoff for personal reasons, economic redundancy (including "Pap anticipé"), end of fixed-term contract, and "other". Results are presented in Table 6. Age composition varies considerably from one subgroup to another: workers laid-off for personal reasons are much older than others, while those classified as "other" are younger. Furthermore, only layoffs for personal reasons exhibit a positive age trend: the older workers are at the date of UI admission, the more likely they are to have been laid-off for personal reasons.

The age pattern of UI inflow for layoffs for personal reasons almost exactly matches PBD incentives for a long ER. A small but significant "peak-above" pattern is present at age 50 after the reform. A very strong "hole-below/peak-above" pattern is present at age 55 before the reform. This pattern almost vanishes after the reform while corresponding admissions seem to have shifted to above age 57.

Turning to economic redundancies, evidence of the responsiveness of the age pattern of UI inflow to PBD incentives (for long ER) is also present. And yet, its form differs. First, the magnitude of the before/after change is less marked for economic redundancies than for layoffs for personal reasons. This may reflect the fact that, when facing economic difficulties, employers have less opportunity to design employment reduction plans that take UI rules into account. Second, at age 50, rather than the "peak-above" pattern observed for layoffs for personal reasons, the pattern seems rather a "hole-below" one. This suggests two different behaviors on the part of employers: on the one hand, a propensity to spare workers just below age 50 from economic redundancy; on the other hand, a propensity to take advantage of more favorable UI terms so as to peacefully get rid of supposedly less productive older workers.

As regards the "end-of-contract" terminations, evidence of behaviors based on PBD incentives reserved to workers with a long ER is

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[25] Initial payment of UI benefits can be delayed in order to prevent unemployed workers from receiving other job termination payments at the same time. In addition to a delay corresponding to payment of paid leave, a delay is applied when severance pay is higher than the amount required by law or in the case of severance pay that is not required by law (see Appendix D for a description of legally required severance pay), including severance pay for employees with less than a year of tenure or for early termination of a fixed-term contract. These types of severance pay are probably most frequent for workers with an intermediate ER who do not have a complete ER before becoming unemployed.

[26] The sample with termination category specified is 9.4% smaller than the baseline sample (66,687 versus 73,583 observations) but not statistically different.

[27] They come from merging UI and unemployment spell datasets.

[28] Note that stratification by sex has also been carried out but the results obtained provide no clue as to the interpretation of baseline evidence. For this reason, they are not reported here.

Table 5
Sample with reasons for termination, distribution by reason for termination and ER category (%).

| | UI admissions registered… | | | | | | |
| | January 1, 2001 June 30, 2002 | | July 1, 2002 Dec. 31, 2002 | | January 1, 2003 Dec. 31, 2005 | | |
Termination category \ Emp. record (ER)	Interm. (6)	Long (7&8)	Interm. or Long (6')	Long (8')	Interm. (B)	Long (C&D)	Total
End of contract	2.2	1.5	1.5	0.3	4.2	4.3	14.0
Economic redundancy	0.9	5.6	2.9	1.7	1.5	15.4	28.0
Layoff for pers. reasons	1.6	11.9	4.0	0.3	3.1	25.0	48.7
Resignation	0.1	0.5	0.2	0.1	0.2	0.9	2.0
Other	0.8	1.8	1.0	0.7	1.0	2.1	7.4
Total	5.7	21.2	9.7	5.7	10.1	47.6	100.0

Table 6
Targeted analysis (model 2) stratified by job termination category, OLS estimates.

| Age thresholds | | Layoff for pers. reas. | | Eco. redundancy | | End of contract | | Other category | |
		Before	After	Before	After	Before	After	Before	After
50.00	$\hat{\zeta}$	+.03 (.08)	+.00 (.07)	-.33*** (.10)	-.16** (.08)	-.31** (.13)	-.24** (.11)	-.27 (.16)	-.20 (.13)
	$\hat{\eta}$	+.15* (.08)	+.19*** (.07)	-.13 (.10)	-.05 (.13)	+.08 (.13)	-.16 (.11)	-.12 (.16)	+.17 (.13)
55.00	$\hat{\zeta}$	-.18** (.08)	-.03 (.07)	-.07 (.10)	+.11 (.08)	-.08 (.13)	+.09 (.11)	+.10 (.16)	+.02 (.13)
	$\hat{\eta}$	+.77*** (.08)	+.21*** (.07)	+.82*** (.10)	+.51*** (.08)	+.56*** (.13)	+.12 (.11)	+.48*** (.16)	+.30** (.13)
55.75	$\hat{\zeta}$	+.43*** (.08)	+.14** (.07)	+.31*** (.10)	+.28*** (.08)	+.26* (.13)	+.20* (.11)	+.48*** (.16)	+.17 (.13)
	$\hat{\eta}$	+.29*** (.08)	+.12* (.07)	+.29*** (.10)	+.08 (.08)	+.20 (.13)	+.13 (.11)	+.15 (.16)	+.06 (.13)
57.00	$\hat{\zeta}$	+.07 (.08)	-.03 (.07)	-.17* (.10)	-.01 (.08)	-.03 (.13)	+.21* (.11)	-.18 (.16)	-.01 (.13)
	$\hat{\eta}$	+.22*** (.08)	+.46***(.07)	+.09 (.10)	+.27*** (.08)	-.09 (.13)	+.28** (.11)	-.06 (.16)	+.25* (0.13)
58.00	$\hat{\zeta}$	-.00 (.08)	+.22*** (.07)	-.06 (.10)	-.10 (.08)	-.19 (.13)	+.15 (.11)	-.43*** (.16)	-.19 (.13)
	$\hat{\eta}$	+.15* (.08)	+.00 (.07)	-.10 (.10)	-.22*** (.08)	+.01 (.13)	+.03 (.11)	-.19 (.16)	-.12 (.13)
	$\hat{\gamma}$	+.0123*** (.0008)		-.0088*** (.0010)		-.0274*** (.0013)		-.0158*** (.0016)	
		$N = 800$		$N = 800$		$N = 800$		$N = 796$	
		$R^2_{adj} = .50$		$R^2_{adj} = .55$		$R^2_{adj} = .45$		$R^2_{adj} = .27$	
		$\overline{\log y} = 3.63$		$\overline{\log y} = 3.09$		$\overline{\log y} = 2.40$		$\overline{\log y} = 2.00$	
		$\overline{\log y}_0 = 3.15$ ***		$\overline{\log y}_0 = 3.43$ ***		$\overline{\log y}_0 = 3.03$ ***		$\overline{\log y}_0 = 2.68$ ***	

Standard errors in parentheses. Significant at ***1%, **5%, *10%.

weaker: a "peak-above" pattern is indeed present at age 55 before the reform, but it is of a lower magnitude than for dismissals; furthermore, there is no evidence of displacement to age 57 after the reform (no "hole-below/peak-above" pattern). The profile of inflows at 50 suggests a responsiveness to incentives that is specific to workers with an intermediate ER: a "hole-below" pattern at age 50 is observed before the reform; this pattern is attenuated after the reform when 50 is no longer a critical age threshold (see Figs. 2 and 3). If the "end of contract" category points to an outsider profile, how should the response to UI rules observed before the reform be interpreted? One possibility might be that workers whose employment contract terminates just below a critical age thresholds try to get temporary jobs long enough to bring them above the age threshold, rather than immediately claiming UI benefits. Such deferral of receipt of UI benefits in order to get better terms is consistent with the literature.[29] Finally, the analysis conducted on terminations for "other" reasons provides no evidence of significant response to UI incentives except just above age 55 before the reform. However, the model has a poor fit.

5.2.4. Combined analysis

What if incentives, as defined by ER, and bargaining conditions, as captured by job termination categories, are aligned? This question is addressed here by crossing the two dimensions. Results are presented in Table 7. Workers with an intermediate ER whose job termination is not due to dismissal can be considered "pure" outsiders (with unstable employment and no bargaining power). Deviations from the age trend are never significant. Workers dismissed with a long ER can be considered "pure" insiders. Before the reform, the "hole-below/peak-above" pattern is remarkably salient at age 55 while a smaller peak is observed just above age 57. After the reform, the peak above age 55 is much attenuated, while a "peak-above" pattern arises at age 57, which is consistent with the before/after change in PBD incentives.

The two remaining combinations show mixed profiles. In terms of the age pattern of UI inflow, workers with a long ER whose job loss is not due to dismissal are not very different from "pure" insiders. Before the reform, the age 55 threshold exhibits a "hole-below/peak-above" pattern which is consistent with PBD incentives. After the reform, the peak just above 55 is greatly attenuated, while a new significant peak appears just above 57. The age pattern of UI inflow for dismissed workers with an intermediate ER is similar to that of all workers with an intermediate ER, whatever their job termination category, but with stronger magnitudes. Before the reform, the inflow just above age 55 is significantly higher than the trend; this peak vanishes after the reform. Meanwhile, a significant peak arises just below 58. This points to a distance-to-retirement effect at younger ages than what UI rules would lead us to expect (see Section 5.2.2).

These findings complete the interpretation. First, the job termination category provides information about workforce management practices: some firms employ a lot of workers under indefinite-term contracts and are concerned about their reputation as a "fair" employer; some others mainly use short-term contracts. Second, the job termination category provides information about the likelihood

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[29] In the literature on UI eligibility effects, Green and Sargent (1998) find evidence of a concentration of job spell durations: (1) at the entrance requirement point and (2) at the point at which individuals qualify for the maximum duration of UI benefits.

Table 7
Targeted analysis (model 2) stratified by ER-category × job termination category, OLS estimates.

Age thresholds		Intermediate ER Dismissal		Intermediate ER All other categ.		Long ER Dismissal		Long ER All other categ.	
		Before	After	Before	After	Before	After	Before	After
55.00	$\hat{\zeta}$	-.08 (.19)	-.08 (.13)	+.29 (.18)	+.06 (.13)	-.10 (.08)	0.02 (.06)	-.17 (.16)	.08 (.11)
	$\hat{\eta}$	+.54*** (.19)	+.02 (.13)	+.17 (.18)	-.00 (.13)	+.83*** (.08)	+.23*** (.06)	+.72*** (.16)	+.26** (.11)
55.75	$\hat{\zeta}$	+.09 (.19)	+.26* (.13)	+.12 (.18)	+.20 (.13)	+.45*** (.08)	+.12** (.06)	+.51*** (.16)	+.17 (.11)
	$\hat{\eta}$	+.18 (.19)	+.09 (.13)	+.10 (.18)	-.03 (.13)	+.29*** (.08)	+.04 (.06)	+.34** (.16)	+.02 (.11)
57.00	$\hat{\zeta}$	-.28 (.19)	+.12 (.13)	+.11 (.18)	+.15 (.13)	+.12 (.08)	-.03 (.06)	-.08 (.16)	+.16 (.11)
	$\hat{\eta}$	+.12 (.19)	+.05 (.13)	-.40* (.18)	-.07 (.13)	+.26*** (.08)	+.44*** (.06)	+.19 (.16)	+.35*** (.11)
58.00	$\hat{\zeta}$	-.20 (.21)	+.51*** (.14)	-.20 (.18)	-.10 (.13)	+.08 (.08)	+.12** (.06)	-.34*** (.16)	+.03 (.11)
	$\hat{\eta}$	+.25 (.19)	+.04 (.14)	-.01 (.18)	-.08 (.14)	+.17** (.08)	-.04 (.06)	-.05 (.16)	-.13 (.11)
	$\hat{\gamma}$	-.041*** (.002)		-.046*** (.002)		.008*** (.001)		-.008*** (.002)	
		$N = 641$		$N = 642$		$N = 648$		$N = 647$	
		$R^2_{adj} = .50$		$R^2_{adj} = .56$		$R^2_{adj} = .61$		$R^2_{adj} = .23$	
		$\overline{\log y} = 1.75$		$\overline{\log y} = 1.94$		$\overline{\log y} = 3.94$		$\overline{\log y} = 2.25$	
		$\log y_0 = 3.57$ ***		$\log y_0 = 3.47$ ***		$\log y_0 = 3.62$ ***		$\log y_0 = 2.51$ ***	

Standard errors in parentheses. Significant at ***1%, **5%, *10%.

of bargaining on the terms of the separation and the balance of bargaining power between employer and worker: bargaining between the employer and the worker exists in the case of dismissal; a layoff for personal reasons indicates that the worker has relatively strong bargaining power; economic redundancy indicates lower bargaining power for the worker. When dealing with "pure" insiders (long ER and dismissal), employers seem systematically to take UI age thresholds into account in order to improve workers' situation. Conversely, employers have no reason to care about the situation of "pure" outsiders, since they have no bargaining power and the reputation of the firm is not at stake. Behaviors regarding mixed profile workers are intermediate. Some workers seem to be able to hold temporary jobs long enough to reach the critical age of 55 (in order to get a longer PBD or exemption from job search), or at least age 50 (a pure "entitlement effect"). The larger effect for high tenured workers (those with a long ER in this study) is also found by Winter-Ebmer (2003) who writes: "firms can take advantage of the extended benefit duration to get rid of high-tenured and therefore expensive workers."

A complementary analysis focusing on the role of individual worker characteristics (sex, education, sector, etc.) is available in Appendix B. Results confirm an insider/outsider interpretation: all other things being equal, workers with little education, low qualifications, low wages, and those who are foreigners are less likely, in the event of job termination, to reach the age thresholds which would qualify them for more advantageous benefits.

6. Estimating the effect of the reform on the age of workers dismissed close to retirement

The last step of our analysis is to quantify the differentiated effect of the reform depending on time-distance to retirement. More precisely, the point is to put a number on the spike displacement documented in the previous section, i.e. to evaluate the average increase in the age of workers entering UI close to retirement. This will enable comparison to the effects of other policies aimed at reducing early exit from the labor force. Since most of the effects identified so far concern dismissed workers, our analysis here is restricted to this group, whom we regard as insiders. The analysis above suggests that the reform has much less effects on outsiders (workers whose job termination is due to end-of-contract or other reasons), which we interpret as reflecting their lack of the bargaining power that would be necessary to influence their date of job termination in order to get better separation terms.

Figs. 8 and 9 depict, from 2001Q1 to 2005Q4, the series of quarterly UI inflow as well as the corresponding series of mean age at admission for two distinct age groups of dismissed workers: 50 to 54 (Fig. 8); 55 and over (Fig. 9). The former group is "far from retirement," while the latter is "close to retirement." UI admissions under 2001 rules are distinguished from those under 2003 rules by a darker color. From 2003Q1 on, mean ages correspond to total inflow (under 2001 or 2003 rules). Inflows reflect economic conditions (as depicted in Fig. 5): they rise between 2001Q1 and 2002Q2 and then remain high until the end of the period. Inflows of workers age 55 and over seem to fluctuate more, with a second rise after 2002Q1. The 2003Q1 inflow corresponds to a spike, especially for workers age 55 and over. This may reflect prolongation of a trend, a seasonal increase, or an effect of the change in UI rules. A slight declining trend seems to be at work between 2004Q1 and 2005Q4 for those age 50 to 54, but not for entrants age 55 or over.

The general pattern of the series of mean ages is quite different for workers age 50–54, on the one hand, and those age 55 or over, on the other. For the 50–54 age group, there is a slight negative trend until 2002Q4, but, overall, mean age is remarkably steady over the whole period, at around 52.5 years old. Volatility is much higher for workers age 55 and over, with a decreasing trend until 2002Q4 and a reversal from 2003Q3 on, when the mean age rises from around 57.3 to over 57.6. We argue that this reversal for workers age 55 and over results from reduction of PBD due to the UI reform.

Previous analysis leads us to apply a difference-in-differences (DD) quantification strategy comparing the 55 and over age group to the 50–54 age group.[30] Admittedly, the younger group also experienced a reduction in PBD, but so far our results suggest that this change had very little impact on this age group (see Fig. 6 and 7); if anything, there was a small increase in mean age. This issue is considered again at the estimation stage. Before that, we have to check that the validity condition for a DD quantification is satisfied, i.e. that a common trend exists between the two age groups before the reform.

6.1. Identification of a common trend before the reform

Two independent linear trends are estimated before and after the date of the reform, and results are compared between the two age

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[30] We have also conducted a regression discontinuity (RD) analysis focusing on workers age 55 and over with the aim of estimating a local effect of the reform on January 1, 2003. No significant effect was obtained which suggests a gradual effect.
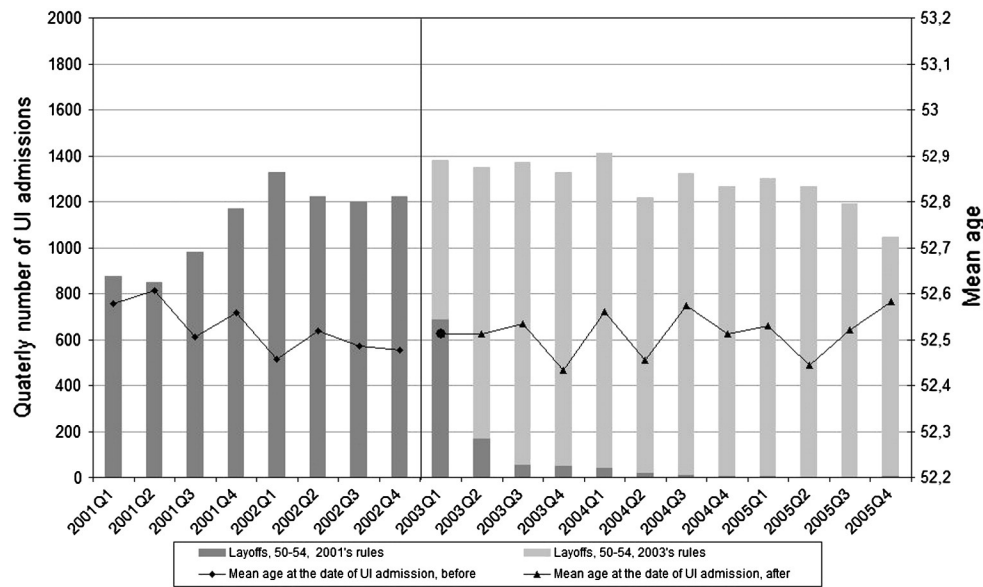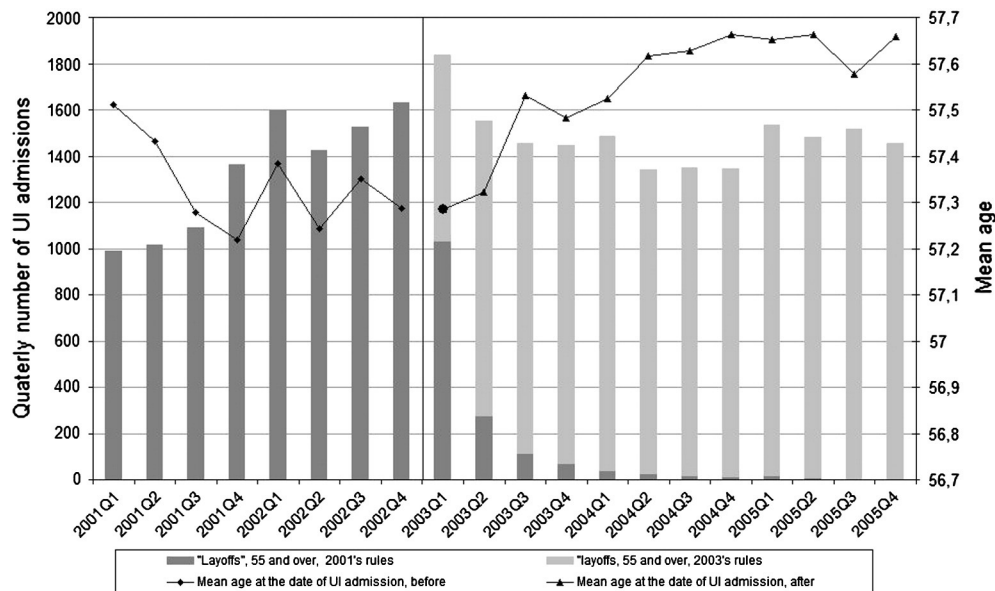
Fig. 8. 50–54, dismissals.

Fig. 9. 55 and over, dismissals.

groups. The date of the reform is denoted $t^* =$ January 1, 2003. For any UI admission i, let t_i denote the corresponding date and Y_i the age of the worker at that date. In order to estimate independent trends before and after the reform, the model is written as

$$E[Y_i|t_i] = \overline{Y} + \beta_0 \tilde{t}_i + \rho T_i + \beta_1 T_i \tilde{t}_i$$

where $\tilde{t}_i \equiv t_i - t^*$ and $T_i = 1(t_i \geq t^*)$. Parameters β_0 et β_1 capture the age trends respectively before and after January 1, 2003, while parameter ρ ensures that these trends are measured independently. Table 8 details the OLS estimation of the previous model over the two age groups of dismissed workers. Before the reform, trends are significantly negative for dismissed workers both those age 50 to 54 and those age 55 and over. More importantly in justifying application of a DD strategy, the estimates are the same: a common age trend is indeed at work before January 1, 2003. A possible interpretation is that, when employers

reduce their workforce to face a downturn, they dismiss the oldest workers first.

Note that the interpretation of parameter β_1 is not as straightforward as that of β_0. Let the assignment status be denoted S_i with $S_i = 1$ when i is assigned to 2003 rules (reduced PBD) and $S_i = 0$ when i is assigned to former rules. Because we do not observe the date of job termination (which determines assignment) but only that of UI admission, whereas $T_i = 0 \Rightarrow S_i = 0$, $T_i = 1 \nRightarrow S_i = 1$: the population of workers admitted after December 31, 2002, includes workers assigned to previous rules as shown above in Figs. 8 and 9. More precisely, the 2003Q1 inflow contains some workers assigned to previous UI rules, whereas there are virtually none after 2004. Hence, the age trend captured by β_1 combines the effects of time and of assignment to new rules. Our goal, however, is not to study a gradual effect but simply to measure an average effect over the post-reform period.

Table 8
Linear regression with changing trend, mean age, OLS estimation.

Dismissals		Jan. 1, 2001–Dec. 31, 2005	
		Age at the date of UI admission	
		50–54	55 and over
	$\hat{\alpha}$	52.43***	57.23***
	(std−err)	(0.03)	(0.03)
Trend before:	β_0	−.00024***	−.00023***
	(std−err)	(.00008)	(.00008)
	$\hat{\rho}$	.08**	.11**
	(std−err)	(.04)	(.04)
Trend after:	β_1	+.00002	+.00033***
	(std−err)	(.00004)	(.00004)
	N	23,186	26,977
	R^2	.0004	.0056

Standard errors in parentheses. Significant at ***1%, **5%, *10%.

Table 9
A DD estimate of the effect of a reduction in PBD.

Dismissals	(1)	(2)	(3)	(4)
	Jan. 1, 2001–Dec. 31, 2005			Jan. 1, 2001 Dec. 31, 2003
	Age at the date of UI admission			
$\hat{\alpha}$	52.53***	52.80***	52.44***	52.53***
(std−err)	(0.02)	(0.40)	(0.08)	(0.02)
$\hat{\beta}$	−0.03	−0.01	−0.00	−0.08***
(std−err)	(0.02)	(0.03)	(0.03)	(0.03)
$\hat{\gamma}$	4.72***	4.72***	4.63***	4.73***
(std−err)	(0.02)	(0.02)	(0.02)	(0.02)
Effect $\hat{\delta}$	0.35***	0.35***	0.32***	0.34***
(std−err)	(0.03)	(0.03)	(0.03)	(0.04)
Date of admission	No	Yes	No	No
Individual characteristics	No	No	Yes	No
R^2	0.69	0.69	0.70	0.68
N	50,163	50,163	50,163	29,571

Standard errors in parentheses. Significant at ***1%, **5%, *10%.

6.2. A difference-in-differences quantification

To this end, we conducted a DD analysis. For any UI admission i, let $R_i = 1(Y_i \geq 55)$ denote a group dummy taking the value 1 for dismissed workers age 55 or over at the date of UI admission. The average effect we are interested in is captured by parameter δ defined by $\delta = \Delta^{R=1} - \Delta^{R=0}$ where

$$\Delta^{R=1} = E[Y_i|S_i = 1, R_i = 1] - E[Y_i|S_i = 0, R_i = 1]$$
$$\Delta^{R=0} = E[Y_i|S_i = 1, R_i = 0] - E[Y_i|S_i = 0, R_i = 0]$$

Our intention is to let the difference $\Delta^{R=0}$ capture the common trend identified above. The model is simply specified as

$$Y_i = \alpha + \beta S_i + \gamma R_i + \delta S_i R_i + \varepsilon_i$$

and is estimated by using OLS. Three variants are also considered as robustness checks. Results are provided in Table 9.

Column (1) gives the estimation over all admissions of dismissed workers from January 1, 2001 to December 31, 2005. The estimate $\hat{\alpha}$ is the mean age of workers age 50 to 54 admitted under 2001 rules; $\hat{\alpha} + \hat{\gamma}$ is the mean age of workers age 55 and over. The estimate $\hat{\beta}$ is meant to capture the impact of the change in rules that is common to all older workers dismissed from age 50 on. It is not significantly different from zero to the 10% level which suggests that no underlying common impact of PBD reduction is at work. The issue thus only concerns workers aged 55 and over i.e. workers close to retirement. The DD estimate of the effect $\hat{\delta}$ is significantly positive: +0.35 years, i.e. +4 months.

Columns (2) and (3) test the robustness of the estimates by adding controls. Adding a time control has virtually no impact. In Eq. (3), we add eight individual characteristics: sex, number of children, being a foreigner, marital status, education, qualification, previous wage (in log), industry, type of labor contract and the work time duration the person is seeking. Most of the corresponding estimates are significantly different from zero, but still, the measurement of the effect $\hat{\delta}$ is only very slightly reduced. This confirms the validity of the DD strategy.

Column (4) conducts the analysis over a shorter time interval to check whether the early retirement scheme[31] implemented from January 2004 onward may affect the result. Our concern is that it might have induced a selection effect, barring workers with certain characteristics

from eligibility for UI. Excluding admissions occurring from 2004 onward does not change the estimate of the effect.

7. Conclusion

This paper investigates the influence of UI rules on practices concerning management of the older workforce. We test whether the age thresholds that determine potential benefit duration make a difference as regards the age pattern of UI inflow. Our main result is a displacement of the spike in inflow from age 55 before the reform to age 57 after. The broad picture is remarkably consistent with UI incentives. Three reasons for scheduling dismissals at specific age thresholds are identified: (1) to give workers access to UI benefits over a longer period of time ("entitlement effect"[32]); (2) to qualify workers for exemption from job search requirements; (3) to qualify workers to receive unemployment benefits until they have access to a full pension ("distance-to-retirement effect"). Spikes in inflow are the largest at age thresholds that combine "entitlement" and "distance-to-retirement" incentives.

These findings have direct methodological implications as regards the use of regression discontinuity based on age thresholds to assess the effect of PBD on unemployment duration, a common practice in the literature. Firms and employees manipulate age at job termination: some workers are dismissed just below a relevant age threshold and others are dismissed just above. Such manipulation can invalidate the regression discontinuity assumption that average unemployment duration for individuals just below an age threshold captures information on the counterfactual duration without treatment for individuals who have just reached the age threshold (Lalive, 2008).

Our analysis affords insights into the factors that explain our results. When different variables are taken into account (wage, job termination category, employment record, sociodemographic characteristics), a clear pattern of difference between insiders and outsiders emerges. The job termination category gives a particularly good indication of workforce management practices. Laying off an older worker who has been employed by a firm for a long time (an insider, with a long ER and a high previous wage) damages the

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[31] See Section 3.2 devoted to description of the pension system.

[32] Another "entitlement effect" identified above is the propensity of workers with an outsider's profile to get temporary jobs in order to reach a critical age threshold.

reputation of the firm among its current and potential workforce. Offering the same worker early separation under good financial conditions through unemployment insurance, is a way for the firm to avoid damage to its reputation (Lalive, 2008; Winter-Ebmer, 2003). Such considerations are less important for workers who have been employed by firms for a shorter time and for firms that do not have an internal labor market. A complementary interpretation is that the job termination category indicates whether a separation has given rise to bargaining or not and, if so, it indicates the relative bargaining strength of the employer and the worker. The higher the risk of legal challenge (which is higher for a layoff for personal reasons than for an economic redundancy and practically non-existent for termination of a fixed term contract), the better the conditions that the employer must offer in the form of an early retirement option in order to avoid a legal challenge. Our results can be interpreted in the light of these considerations. When separation takes the form of a layoff for personal reasons, the age pattern of UI inflow systematically reflects the advantages available under proper timing. When the employer can use economic difficulties to justify the separation (which translates into an economic redundancy), it is more difficult for a worker to challenge the dismissal and the employer has less leeway in the timing of the separation. Nonetheless, the age pattern of UI inflow for economic redundancy reflects age incentives generated by UI rules, although to a lesser extent. This indicates that firms first dismiss workers who would be less penalized because they are sure to receive UI benefits until they qualify for a full retirement pension. The incentives created by UI rules are reflected even less in the age pattern of UI inflow for end-of-contract dismissals (and for employees with an intermediate ER) but small jumps in inflow are observed, especially at age 50. One interpretation of this result could be that these workers defer entry into UI by getting temporary jobs long enough to reach age 50 in order to be entitled to longer PBD.

Going beyond these issues of interpretation, we estimate a quantification of the effect of the 2003 PBD reduction on the average age at job termination of older workers eligible for UI. A significant positive effect is found for workers dismissed close to retirement, estimated to be +4 months (on average, these workers lost 20 months of potential benefit duration). This impact on age is quite large compared to the changes associated with other policy reforms regarding older workers in France.

The fact that behaviors regarding insiders who are far from retirement (between 50 and 54 years of age) do not respond to the reform suggests that distance to retirement is crucial. UI is apparently used as a bridge to retirement for older workers in France (as suggested by Hairault, 2012), as in Germany (Grogger and Wunsch, 2013). Some employers seem ready to schedule dismissal of older workers so that PBD will be long enough to cover the time until eligibility for a full pension. The present statistical analysis confirms case studies suggesting opportunistic use of UI (Seignour et al., 2007), and shows that corresponding behaviors are quantitatively significant and result in large costs for the unemployment insurance fund, since these practices especially concern high wage workers. However, translating the findings of this study into policy recommendations requires caution. If labor demand is the most important factor in early retirement, reducing unemployment benefit duration may simply increase hardship among those older workers who are not in a position to negotiate when they leave the labor force. This measure alone would certainly not be sufficient to reverse the trend of early exits from the labor market, which relies on a kind of perverse complicity between employees and employers – at least in France – and on factors that go beyond financial incentives such as social norms or peer effects (Manoli and Weber, 2014). There is evidence that comprehensive reforms are more successful than piecewise policy changes (Belot and van Ours, 2004; Inderbitzin et al., 2013; OECD, 2014). Hence, a reduction in unemployment benefit duration should be linked to other measures such as improvements in training and in job search services for older unemployed workers.

Appendix A. Descriptive statistics

Appendix B. The role of individual characteristics (Logit regression)

The point here is to test whether the *composition* of inflow into UI changes at specific age thresholds. To investigate the role of each characteristic while holding others constant, we run a logistic regression. The response variable is being just above the *age* (rather than just below) at the date of UI admission with $age \in \{50; 55; 57\}$. Covariates

Table A.10
Description of the sample of workers for which individual characteristics are available: sociodemographic characteristics and wage.

	Female (%)		No children (%)		Foreigner (%)		Daily wage (€)	
	Before	After	Before	After	Before	After	Before	After
45.00–49.99	51.2	52.4	39.5	35.2	10.1	9.7	55.9	60.1
50.00–54.99	50.2	52.3	59.1	53.9	9.3	9.1	58.5	60.1
55.00–56.99	42.8	49.6	74.7	70.5	7.1	8.2	71.6	66.3
57.00 and +	40.9	48.3	77.7	77.1	12.2	10.9	76.4	76.8
All	47.6	51.1	59.0	54.3	9.6	9.5	63.1	64.3

Table A.11
Description of the sample of workers for which individual characteristics are available: education.

Education	Low secondary (%)		Vocational (%)		Higher (%)	
	Before	After	Before	After	Before	After
45.00–49.99	35.5	29.1	34.5	38.8	15.5	16.0
50.00–54.99	42.2	38.0	31.1	34.3	13.7	13.9
55.00–56.99	43.9	42.8	28.5	31.7	13.8	12.3
57.00 and +	45.1	40.7	24.9	27.1	17.1	18.0
All	41.0	36.3	30.6	34.1	14.9	15.2

Table A.12
Description of the sample of workers for which individual characteristics are available: qualification.

Qualification	No qualif (%)		Low qualif (%)		Management (%)	
	Before	After	Before	After	Before	After
45.00–49.99	23.0	24.0	49.1	54.8	12.9	12.8
50.00–54.99	21.3	24.3	51.1	54.4	14.5	12.8
55.00–56.99	18.7	22.5	47.2	52.9	20.6	15.1
57.00 and +	18.1	18.4	47.7	50.6	23.5	20.9
All	20.8	22.8	49.2	53.6	16.6	14.8

Table A.13
Description of the sample of workers for which individual characteristics are available: reasons for termination.

Termination category	End of contract (%)		Redundancy (%)		Layoff for PR (%)	
	Before	After	Before	After	Before	After
45.00–49.99	19.8	22.8	25.8	22.9	39.1	41.7
50.00–54.99	17.8	20.6	26.6	26.1	41.6	42.1
55.00–56.99	10.7	16.0	23.2	26.3	55.3	48.1
57.00–59.99	8.8	12.5	22.5	22.8	61.1	56.6
All	15.6	19.1	25.1	24.3	46.6	45.7

Table B.14
Logit regression, maximum likelihood estimations.

Response variable: being just above *age* (rather than just below) at the date of UI admission							
		age = 50.00		*age* = 55.00		*age* = 57.00	
		Before	After	Before	After	Before	After
Female		+**					
Children	0		+		+***	+*	
(ref: 2 children)	1		_***				
	≥3				_**		
Foreigner				_**		+*	
Education	0	_*		_			_**
(ref: 1, High-school)	Vocational						
	2				_**	_	+***
Qualification	0			_*		_*	
(ref: 1)	2						
	3						
Log wage				+***	+**		+**
Industry	A or C			A : _ *	C : + *		
(ref: B)	D		D : + **	D : + *			
	E		E : +		E : + *		
	F or H			H : + *	F : _ *		
	J or L	L : _ **			J : _ *		
	P	P : +		P : _	P : _ ***		
	T					T : +	
	V, R or S		V : _ **	V : _	R : _ *		S : _ ***
	U				U : + ***		
Reason for termination	Eco. redund.						
(ref: End of contract)	Layoff for PR			+			+**
	Resignation						
	Other categ.			_			
Contract	Fixed-term		+		+***		
(ref: standard)	Seasonal						

Significant at ***1%, **5%, *10%.

are: sex, the number of children (if any), being a foreigner, marital status,[33] education,[34] qualification,[35] wage, industry,[36] job termination category, type of labor contract and the working time duration the person is seeking (full time versus part time).[37] The reference is a French married male with two children, upper secondary school education, working as a skilled worker in the construction industry, who lost his job at the end of a fixed term contract and is seeking a standard full time job. Results are presented in Table B.14. To facilitate reading, only the signs of significant (at the 10% level) or almost significant associations are reported. A detailed interpretation of these findings is beyond the scope of the present study. The point here is to check that they support (or at least do not infirm) an insider/outsider interpretation.

B.1. The age 50 threshold

Before the reform, all other things being equal, three characteristics significantly reduce the probability of being just above 50 (rather than just below) at the date of UI admission: being a male, having a low level of education, holding a job in management or business administration. After the reform, the probability is reduced by the fact of having one child, holding a job in the health, social, cultural and or sport sectors; it is increased by the fact of holding a job in the mechanical, or metalworking sectors. Most associations are weakly significant, and one can only speculate as to what they mean. Since females are overrepresented among workers with intermediate ER, the impact of gender may reflect that, after the reform, reaching 50 years of age is no longer an issue for workers with intermediate ER.

B.2. The age 55 threshold

Before the reform, three characteristics significantly reduce the probability of being just above 55 at the date of UI admission: being a foreigner, holding a job in the primary sector, having a low qualification level. Three characteristics increase this probability: earning a high wage, holding a job as a technician in the mechanical–metalworking industry, holding a job as an engineer or executive in manufacturing. These results clearly point to an insider/outsider interpretation within the context of a structural manufacturing industry crisis (see Fig. 5). After the reform, characteristics that reduce the probability of entering UI just above age 55 (rather than just below) are: having more than three children, having a high level of education and, most significantly, holding a non-permanent contract in the public sector (that is, without the status of civil servant). Characteristics that increase the probability of entering UI just above age 55 are: having no children, earning a high wage, holding a job in the communication/entertainment industry, seeking a fixed-term contract. The role of the number of children may be related to retirement system and the fact that having children involves employment interruptions. People with no children are more likely to have contributed more than 160 quarters to the pension system at age 55 than others. The role of education may also have to do with a late entry into the labor market which reduces the likelihood of having contributed more than 160 quarters to the pension system at 55. All in all, it seems that being an insider is less critical for entering UI just above age 55 after the reform.

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[33] Not mentioned in the table of results but controlled for.
[34] Education categories: 0 — lower secondary education; 1 — high-school; vocational degree; 2 — higher education.
[35] Qualification categories: 0 — no qualification; 1 — low qualification; 2 — intermediate profession; 3 — management.
[36] The list of industries: A — agriculture, ship, fishing; B — construction; C — Electricity, electronics; D — mechanical, metalworking; E — process industry; F — flexible materials, wood, graphic industries; G — maintenance; H — engineers, manufacturing industry executives; J — transport, logistics and tourism; K — craft; L — management, business administration; M — IT and telecommunications; N — Study and research; P — public administration, legal professions, army and police; Q — banking and insurance; R — trade; S — hotels, restaurants and food; T — services to individuals and communities; U — communication, information, art and entertainment; V — health, social, cultural and sport sector; W — education and training.
[37] Not mentioned in the table of results but controlled for.

B.3. The age 57 threshold

Before the reform, there is little evidence of selection effects linked to crossing the age 57 threshold. The change is dramatic after the reform: the probability of being over 57 at the date of UI admission is significantly increased by the fact of having a high education, a high wage and of having been laid off for personal reasons; it is reduced by the fact of having a low education, of holding a job in the hotel and restaurant industry. These features all point toward a robust insider/outsider interpretation.

Appendix C. Other policies concerning older workers over the period under study

C.1. Industry specific severance pay

Most industries have their own collectively bargained rules for severance pay which apply when their terms are more favorable than legal requirements. Age thresholds often play a part[38] but no far reaching changes occurred over the period under study.

C.2. Tax on layoff of older worker ("contribution Delalande")

This tax was levied on firms when a worker aged 50 or more was dismissed. It came on top of severance pay. The amount of the tax was higher for firms with 50 or more employees than for smaller ones. It increased with the age of dismissed employees and reached a maximum for workers aged 56 or 57; it decreased for older ages (Behaghel et al., 2008). The conditions and the amount of this tax changed several times between its creation in 1987 and its abolition in 2008, but they did not change over the period under study.

C.3. Exemption from the job search obligation

Throughout the period under study, older workers could in some cases be granted a job search exemption called DRE. For workers covered by the UI system, the requirement was to be at least 57.7 years old at the time of job loss. If they had contributed 160 quarters or more to the pension system, they only had to be over 55. The exemption could only be proposed to recipients likely to receive unemployment insurance or unemployment assistance benefits up to the age of retirement. These conditions did not change over the period under study. Incentives are not clear here: these rules made unemployment closer to non-participation in the labor market.

Appendix D. Job termination category and the risk of legal challenge

D.1. End of fixed-term contract

Since fixed-term contracts automatically expire without initiative from either party, their termination leaves little room for dispute.

D.2. Economic redundancy

Economic redundancy can be invoked by an employer in the case of job destruction due to insufficient profitability. In such a case, the employer is not allowed to replace the dismissed worker by filling the same position over the next 12 months. In practice, legal challenges to economic redundancy represent less than 3% of all the challenges that follow dismissals (Serverin and Valentin, 2009).

D.3. Layoff for personal reasons

Layoff for personal reasons ("dismissals for personal/professional reasons") refers to dismissals based on employee behavior. This category can be invoked by the employer in case of employee negligence (or even misconduct), but, most often, the employer claims that the employee is unable to perform the job adequately. In this case, the employer is free to replace the dismissed worker but there is a high risk of legal challenge. Almost all legal challenges following a layoff involve this category of dismissal (Serverin and Valentin, 2009).

The French Labor Code guarantees a right to severance pay for dismissals (after a tenure of at least 1 year without interruption), except in case of serious misconduct.[39]

Appendix E

A simple model that clarifies the interpretation of the parameters identified in our empirical analysis can be found online at http://o.baguelin.free.fr/fv.htm.

References

Andersen, P.M., Meyer, B.O., 1997. Unemployment insurance take-up rates and the after-tax value of benefits. Q. J. Econ. 112 (3), 913–937.

Behaghel, L., Crépon, B., Sédillot, B., 2008. The perverse effects of partial employment protection reform: the case of French older workers. J. Public Econ. 92 (3–4), 696–721 (April).

Behaghel, L., Blanchet, D., Debrand, T., Roger, M., 2011. Disability and social security reforms: the French case. NBER Working Paper Series 17055 (May).

Belot, M., van Ours, J., 2004. Does the recent success of some OECD countries in lowering their unemployment rates lie in the clever design of their labour market reforms? Oxf. Econ. Pap. 56 (4), 621–642.

Ben Salem, M., Blanchet, D., Bozio, A., Roger, M., 2010. Labor force participation by the elderly and employment of the young: the case of France. In: Gruber, J., Wise (Eds.), Social Security Programs and Retirement around the World: The Relationship to Youth Employment. NBER University of Chicago Press, pp. 119–146.

Blasco, S., 2008. The Non Take-up of an Unemployment Insurance Reform in France: A Duration Analysis with Competing and Defective Risks, Documents de travail du Crest no 2008-14.

Bozio, A., 2008. Impact evaluation of the 1993 French pension reform on retirement age. Pens. Int. J. 13 (4), 207–212.

Card, D., Levine, P., 2000. Extended benefits and the duration of UI spells: evidence from the New Jersey extended benefit program. J. Public Econ. 78, 107–138.

Chetty, R., 2008. Moral hazard versus liquidity and optimal unemployment insurance. J. Polit. Econ. 116 (2), 173–234.

Christofides, L.N., McKenna, C.J., 1995. Unemployment insurance and moral hazard in employment. Econ. Lett. 49, 205–210.

Christophides, L.N., McKenna, C.J., 1996. Unemployment insurance and job duration in Canada. J. Labor Econ. 14, 286–312.

Dares, 2011. Emploi des seniors. Synthèse des principales données sur l'emploi des seniors. Document d'études de la Dares no 164.

Fremigacci, F., 2010. Maximum benefits duration and older workers' transitions out of unemployment: a regression discontinuity approach. Document de recherche EPEE no 10–12.

García-Pérez, J.I., Jiménez-Martín, S., Sánchez-Martín, A., 2013. Retirement incentives, individual heterogeneity and labor transitions of employed and unemployed workers. Labour Econ. 20, 106–120.

Green, D.A., Riddell, W.C., 1997. Qualifying for unemployment insurance: an empirical analysis. Econ. J. 107 (440), 67–84.

Green, D.A., Sargent, T.C., 1998. Unemployment insurance and job durations: seasonal and non-seasonal jobs. Can. J. Econ. 31 (2), 247–278.

Grogger, J., Wunsch, C., 2013. Unemployment Insurance and Departures form Employment. Evidence from a German Reform VU University Amsterdam, mimeo.

Hairault, J.-O., 2012. Pour l'emploi des seniors. Assurance chômage et licenciements. Opuscule du Cepremap, Editions de la rue d'Ulm, Paris.

Hanel, B., 2010. Financial incentives to postpone retirement and further effects on employment — Evidence from a natural experiment. Labour Econ. 17, 474–486.

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[38] For example, in the construction industry, standard severance pay is increased by 10% for workers above age 55; in the food retail industry, it is increased by 20% for workers older above age 50. More subtle rules may be involved: in the cardboard industry, for instance, standard severance pay is increased by 25% if the employee is over 50 years old and under 55 and by 15% if the employee is over 55 and under 60; however, for separations of employees between age 55 and 60, if the continuity and level of resources are not insured until the age of entitlement to a full pension, the rate is increased by 25%.

[39] Statutory minimum severance pay is $\frac{1}{5}$ of monthly wages per year of service. For employees with more than 10 years of service, $\frac{2}{15}$ of monthly wages multiplied by the number of years of service beyond 10 years is added. Example: with a tenure of 1 year, severance pay is $\frac{1}{5} \cdot 1 = 0.2 \times$ monthly wage; with a tenure of 20 years, severance pay is $(\frac{1}{5} \cdot 20) + (\frac{2}{15} \cdot 10) = 5.33 \times$ montly wage.

Inderbitzin, L., Staubli, S., Zweimüller, J., 2013. Extended unemployment benefits and early retirement: program complementarity and program substitution. IZA Discussion Paper, no 7330.

Kyyrä, T., 2010. Early retirement policy in the presence of competing exit pathways. Evidence from policy reforms in Finland. Netspar Discussion Papers 10/2010-54.

Kyyrä, T., Ollikainen, V., 2008. To search or not to search? The effects of UI benefit extension for the older unemployed. J. Public Econ. 92, 2048–2070.

Lalive, R., 2008. How do extended benefits affect unemployment duration? A regression discontinuity approach. J. Econ. 142, 785–806.

Lalive, R., van Ours, J., Zweimüller, J., 2006. How changes in financial incentives affect the duration of unemployment. Rev. Econ. Stud. 73 (4), 1009–1038.

Lalive, R., van Ours, J., Zweimüller, J., 2011. Equilibrium unemployment and the duration of unemployment benefits. J. Popul. Econ. 24 (4), 1385–1409.

Le Barbanchon, T., 2012. The effect of the Potential Duration of Unemployment Benefits on Unemployment Exits to Work and Match Quality in France, Document de travail du Crest, no 2012–21.

Manoli, D., Weber, A., 2014. Nonparametric Evidence on the Effects of Financial Incentives on Retirement. Decisions, *mimeo*.

OECD, 2014. Ageing and Employment Policies: France 2014.

Pellizzari, M., 2006. Unemployment duration and the interactions between unemployment insurance and social assistance. Labour Econ. 13, 773–798.

Rebollo-Sanz, Y., 2012. Unemployment insurance and job turnover in Spain. Labour Econ. 19, 403–426.

Seignour, A., Palpacuer, F., Vercher, C., 2007. "Ouvrir la boîte noire du licenciement pour motif personnel". Gérer et Comprendre, no 90 pp. 20–29 (décembre).

Serverin, E., Valentin, J., 2009. Licenciement et recours aux prud'hommes, questions de mesure. In: Gomel, B., Méda, D., Serverin, E. (Eds.), *L'emploi en rupture*, Dalloz, Centre d'études de l'emploi. Presses Universitaires de Paris Ouest, 121–138.

Tatsiramos, K., van Ours, J., 2012. Labor Market Effects of Unemployment Insurance Design. *IZA Discussion paper series* no 6950 (October).

Tuit, S., van Ours, J., 2010. How changes in unemployment benefit duration affect the inflow into unemployment. Econ. Lett. 109, 105–107.

Unédic, 2013. "Qui sont les allocataires de l'assurance chômage?". Etude de l'Unédic (avril).

Van Ours, J., Vodopivec, M., 2006. How shortening the potential duration of unemployment benefits affects the duration of unemployment: evidence from a natural experiment. J. Labor Econ. 24 (2), 351–378.

Winter-Ebmer, R., 2003. Benefit duration and unemployment entry: a quasi-experiment in Austria. Eur. Econ. Rev. 47, 259–273.