The French First Employment Contract: Efficient Screening Device or Kleenex Contract?

Mehmet Bac[*]   Serife Genc[†]

July 3, 2006

Abstract

The controversial novelty in the French Labor Law reform, withdrawn in April 2006, was a contract form under which employers could dismiss young workers on probation without justification. Proponents argued that the reform would improve screening and boost employment whereas opponents dubbed it the "Kleenex contract." We show that the new contract can produce an incentive to dismiss even suitable workers but that this harmful effect could be mitigated by instituting public ratings of firms according to their propensity to dismiss young workers. Informed workers could then respond to job offers according to firms' layoff records, which in turn would restore promotion incentives and efficient screening.

Key Words: French labor law reform, contracts, efficient screening.
JEL classification number: J38, J41.

[*]Sabanci University, Faculty of Arts and Social Sciences, Tuzla, Istanbul, Turkey 34956, e-mail: bac@sabanciuniv.edu

[†]University of Pittsburgh, Department of Economics, 4S01 W. W. Posvar Hall Pittsburgh, PA. 15260, e-mail: seg34@pitt.edu.

1 Introduction

In March 2006, crowds in more than 150 cities and towns of France protested the new labor law. The highly controversial novelty was the First Employment Contract (Contrat Première Embauche, or CPE) which allows firms to discharge workers under age 26 within the first two years of their employment without justification. The CPE reverts to a standard full-time contract after the two-year trial period.[1] If adopted, it was to produce a considerable reduction in the cost of firing a young employee on probation.

Compared with the U.S. and most of the Western Europe, the actual French labor market is heavily regulated, lacks mobility and operates under rigid contracts. Workers seek open ended contracts called CDI (contrat à durée indéterminée), a *de facto* long-term contract form under which workers cannot be fired unless they are found in extremely grave professional fault. Firms seriously hesitate before creating a CDI position and symmetrically workers do not leave their CDI-job until they get a better CDI, keeping their current unhappy position for years, sometimes an entire career. Under its current regulations the French labor market seems far from generating efficient matching outcomes. The CPE was introduced with the hope of curing this problem.

Faced with violent protests and opposition from over 68 percent of the population, the French government withdrew the law on April 10. Opponents warned that the CPE could be misused by employers and dubbed it the *"Kleenex contract"* as, in their opinion, young workers would be discarded within short terms like a facial tissue.[2] Proponents pointed out that employers are reluctant to create new jobs when the cost of dismissing unsuitable workers is extremely high. They viewed CPE as an effective reform to combat France's high youth unemployment rate and,

---

[1] This new contract form applies to employers with more than 20 workers; employers with less than 20 workers already have access to a similar contract form, called the New Employment Contract (Contrat Nouvelle Embauche, CNE), since August 2005.

[2] They also considered it a step toward eroding long-cherished employment rights and argued that it would undermine job security and decrease the chances of young people to find a permanent job. See BBC NEWS website at: http://news.bbc.co.uk/go/pr/fr/-/1/hi/world/europe/4816306.stm published: 2006/04/11 12:31:49 GMT. Becker (2006) advances the view that high participation to demonstrations by both unions (current insiders) and university students (a large fraction of them will be the future insiders) can be explained by participants' belief that current labor law reforms will be extended to employees over the age 26 in the future. March 26, 2006, http://www.becker-posner-blog.com/archives.

at the same time, to improve efficiency by producing better job-worker matching outcomes.

The pro-CPE argument is well-known to the student of labor economics: under standard assumptions the (credible) threat of terminating the contract of an unsuitable worker is a necessary condition for efficient screening. Opponents' view that the CPE could be misused seems economically more puzzling: if firms don't hire for the pleasure to fire, why would they "misuse" the right to costless contract termination? Is there a plausible labor contracting environment in which firms can benefit from systematically firing even suitable young workers, where one can reasonably dub the CPE a Kleenex contract?

We identify such an environment. We show that a firm in that environment has an incentive to deny promotion and replace its suitable workers by young, cheaper labor. As this incentive is foreseen in equilibrium, the firm ends up losing its ability to effectively screen its workers. Introduction of CPE in that environment therefore harms, rather than promote, screening through probation. The result suggests that French student protesters might be acting in a purely self-interested way, for they are the most likely to get jobs in the near future and lose from firms' costless contract termination option. Below we expose the essential features of our model, in particular its implications on efficient screening. We also propose an institutional arrangement to mitigate firms' incentives to misuse CPEs and explain how our policy prescription would work in conjunction with a CPE-type reform.

We consider an asymmetric information model in which the best solution to the firm's screening objective involves an ascending wage profile. During the early phase of employment, workers are induced to accept as part of the screening process a sacrifice in the form of low wages, justified by expectation of a compensating improvement later on if the worker reveals a suitable type (Waldman (1984), Bac (2000)).[3] However, because it benefits from the worker's payoff sacrifice during

---

[3] The literature offers several explanations for an ascending wage profile. Increases in productivity along the career can translate into larger wages especially if some observability conditions are met. Another explanation, due to Becker (1964), is accumulation of firm-specific human capital, which isolates the internal labor market and generates ex-post bilateral monopoly. Lazear (1979) shows that deferred earnings can serve to align workers' effort incentives, that is, to induce the worker to sacrifice utility in the early phase for the future surplus he expects capturing later on. Jovanovic (1979) points to matching considerations as a factor producing an ascending wage profile. As in Bac (2000), in our model the wage profile is shaped by the firm's screening considerations. See Lazear and Oyer (2004) for a general discussion of internal and external labor

probation, the firm has a clear incentive to exercise its contract termination option too soon. Suitable worker types who foresee this will reject an entry-level contract that imposes a payoff sacrifice; in this environment CPEs will become Kleenex contracts of short duration and perform only partial screening.

A possible solution to this dilemma, we argue, is to institute in conjunction with the CPE reform public ratings of firms in terms of their propensity to terminate probationary contracts. The purpose of this arrangement is simply to effectively disseminate layoff information. Workers informed about the firm's layoff record can formulate their contract acceptance strategies accordingly; they can switch to rejecting a CPE-type up-or-out contract involving a sacrifice during probation if the firm is systematically prematurely dismissing young workers. Firms misusing CPEs to their advantage would damage their labor market reputation and lose their ability to screen efficiently. Those honoring the promise to promote suitable workers would keep attracting suitable workers at low-wage entry posts on the one hand and screen out unsuitable workers on the other. Public reaction to the French labor reform could be softened considerably, as our model suggests and we believe, had lawmakers also included into the reform package a mechanism to inform workers about layoff practices of their potential employers.

Layoff information can also spread through friends and families of dismissed workers, the news media and publications by workers' associations of detailed lay-off tracker pages on the internet.[4] Obviously, these sources could never be as fast, reliable, visible and effective as a centralized initiative by the state. The task of providing layoff information would fit perfectly into French National Employment Agency ANPE's mission, which already includes the supply of similar services such helping companies publicize their vacancies, identifying and short-listing job applicants and organizing training courses.

For our prescription to work and public ratings of firms to produce the intended outcome, workers must be responsive to layoff information. There is evidence that workers respond: A study by Khandker (1992), for instance, finds that high-layoff

---

markets as determinants of wage profiles and productivity.

[4]Publication of layoff tracker pages can only serve to produce a coordinated impact on workers' perceptions of the listed firms and jobs. To give two examples among many, http://journalismJobs.com/layoffs.cfm contains a monthly layoff list for the media, http://seattlepi.nwsource.com/venture/layoff.asp offers a list of recent layoffs at Seattle area technology companies.

jobs pay on average higher wages than low-layoff jobs.[5] The reason why workers respond is rooted in the impact of layoff frequency on their perception of jobs; high-layoff jobs cannot be perceived as career-type jobs where employment is relatively long-term and match quality matters substantially. If this is the impact of layoffs on workers' perception of jobs, rejecting an ascending wage profile with deferred compensation from a high-layoff firm becomes individually optimal.

Finally, as in the equilibrium of our model, workers do not have to resort to an endless punishment strategy to generate the disciplinary effect on the firm. If the firm deviates from the efficient screening equilibrium it incurs a loss of reputation for some finite T periods ahead, after which it has an opportunity to re-establish its reputation as offering career-type jobs. Workers' layoff-record-dependent contract acceptance strategy does not involve a self-destructive retaliation; it is an equilibrium strategy, individually costless and, at the same time, strictly beneficial for the firm.

2 The Model

Consider a firm with an infinite horizon and a unit demand of labor per period. Worker performance depends solely on a worker-specific and privately known ability parameter θ, so that the firm's profit in each period is $\theta - w$ where w is the wage. We prefer not to model an effort choice for the worker; nor is there any investment on human capital during employment. These assumptions keep the model simple and focused on the firm's screening problem.

---

[5]The theoretical literature offers risk- and search cost-based explanations for why workers would increase their firm-specific reservation wages in response to a firm's increased frequency of layoffs. For a recent survey of search costs and reservation wages, see Mortensen and Pissarides (1999). Wright (1987) offers a theoretical discussion of the link between reservation wages and layoff probabilities. Compensating wage differentials, paid for perceived differences in job attributes and disutility, is another reason for why workers' reservation wages may differ across firms or industries (Krueger and Summers 1988). Among general determinants of reservation wages, we can cite arrival rate of job offers, productivity, jobless duration, unemployment insurance and benefits, utility of leisure, home production and informal sector job opportunities. McCall (1994) decomposes search costs to distinguish between inspection and experience costs, concluding that jobs with higher experience-match uncertainty will be characterized by a lower reservation wage. In our model, matching and screening considerations also produce an equilibrium starting wage below the market rate.

The firm's profit in a period without employment is zero. It faces a very large number of potential workers who live for two periods, with identical and constant outside option wage w_R per period. Except for their age, workers are observationally identical. Each dying worker is replaced by a young worker of the same θ. Suppose θ can take on two values, θ_L and θ_H, where $\theta_H > \theta_L$ and let $\pi = prob(\theta = \theta_H)$ be common knowledge. We assume that the firm's employment of a high-ability worker generates a positive surplus, i.e., $\theta_H > w_R$. The payoff of a worker consists simply of his wage. The discount factor is denoted β and is common to all the parties.

Worker performance, hence θ, is not contractible but observable by the firm during employment. Under these assumptions, the maximum average per-period profit the firm can obtain is $\theta_H - w_R$, paying the minimum per-period acceptable wage w_R for the maximum worker performance θ_H. Thus, the maximum discounted profit the firm can obtain is $\overline{V} = (\theta_H - w_R)/(1 - \beta)$, which is also the maximal total surplus.

The game begins in period one. The firm's contract options are as follows: it can offer (i) long-term (two-period) contracts $\{w_t, w_{t+1}\}$ (to which only "young" workers can apply) or (ii) short-term contracts $\{w_t\}$ specifying only the current period wage with no reference to continuation nor a wage specification for the next period. Long term contracts can involve *commitment* to continuation for the second period at the specified wage w_{t+1}, or *no commitment*.

A short-term (one-period) contract $\{w\}$ cannot perform screening because the wage w is acceptable to all worker types or none. Therefore under a short-term contract the firm's expected profit in the immediate period is $\theta_E - w$ where $\theta_E = \pi\theta_H + (1 - \pi)\theta_L$ is expected ability.[6]

A long-term contract with commitment binds the firm to the incumbent worker for two periods at the wages w_t and w_{t+1} respectively. Wages are contractible variables, thus any attempt to renegotiate a wage specified in the governing contract

---

[6]We note, however, that the firm's expected profits form using a sequence of short-term contracts in a span of two periods is different. The firm can pick a young worker for the first short-term contract to earn the expected profit $\theta_E - w_R$ in the first period, followed by the profit $\theta_H - w_R$ by retaining the incumbent if he turns out to be of type θ_H, or followed by the profit $\theta_E - w_R$ which it would obtain by switching to outside workers if the incumbent turns out to be of type θ_L. Therefore the firm's maximum discounted profits from short-term contracting in two periods is $(1 + \beta(1 - \pi))\theta_E + \beta\pi\theta_H - (1 + \beta)w_R$.

will be vetoed either by the incumbent worker or the firm. The French "open-ended" contract form (contrat à durée indéterminée (CDI)) *de facto* approximately mimics a long-term contract with commitment, in particular for career jobs that are related to the company's regular business. Under a CDI employers must, in compliance with stringent and bureaucratic procedural statutory constraints, provide real and serious reasons for termination.[7] In terms of screening, a long-term contract with commitment to continuation is the worse contract form because the firm is locked in with a worker of unknown type for two periods. Under this contract the firm's average per-period profit is $\theta_E - w_R$.

Under a long-term contract without commitment to continuation, the firm retains the right to terminate the contract at the end of the first period, but continuation with the incumbent worker implies payment of the contract wage w_{t+1} in the second period. The CPE, defined in the bill as a permanent contract with a consolidation period of two years, then to be converted into a standard CDI full-time contract, is closely approximated by a long-term contract without commitment. Accordingly, the analysis below mostly focuses on long-term contracts without commitment.

The firm's beliefs at the interim continuation decision stage is denoted $\mu = prob(\theta = \theta_H)$. Since the firms observes, hence learns, the worker's θ during employment, μ either takes the value 0 or 1. The firm's strategy in the beginning of each period is to make a public contract offer if no worker is on contract for that period; if there is an incumbent worker on a (long-term) contract, the firm's strategy prescribes termination or continuation given beliefs μ about the worker's type. Following a termination decision, the firm makes a contract offer to outside workers, picks one among those who accept and a new employment relationship begins. The workers' individual strategies are simple: make a binary acceptance/rejection choice given a contract offer.

The following strategy profile is our benchmark case:

---

[7]The details of the dismissal procedure under CDIs suggest that termination costs are large: a warning must be issued before initiating any dismissal procedure and the employee be given the opportunity to provide explanations. The employer then has to comply with a notice period (which is two months in standard cases). Severance pay usually ranges between one fifth to one-third of the monthly pay for each year of service. It is at virtually no cost for an employee to start litigation and rare that the employee's claims be dismissed with no award being made against the ex-employer.

Kleenex strategies.

- *The firm.* In every period $t + k$ where k is an even number, offer the short-term contract $\{w_R\}$ and pick a young worker among those who accept. In periods $t + k + 1$, repeat the same offer to the incumbent worker if $\theta = \theta_H$ is revealed, to outside workers if $\theta = \theta_L$ is revealed.

- *Individual workers.* Accept a contract offering for the immediate period a wage at least as large as w_R, reject otherwise.

Kleenex strategies, which trivially constitute a PBE,[8] admit only short-term contract offers. In this equilibrium the firm's profit in periods $t + k$, for k even, is $\theta_E - w_R$, and in periods $t + k + 1$ it is $\theta_H - w_R$ with probability π and $\theta_E - w_R$ with probability $1 - \pi$. Thus, if Kleenex strategies are played forever, the firm's discounted profits, denoted $V^X(\infty)$, satisfies

$$V^X(\infty) = \theta_E - w_R + \beta[(1 - \pi)V^X(\infty) + \pi(\theta_H - w_R + \beta V^X(\infty))].$$

As we show below, $V^X(\infty)$ is smaller than $(\theta_H - w_R)/(1 - \beta) = \overline{V}$, the maximum discounted payoff the firm can hope to obtain in any PBE. This equilibrium is inefficient.

3   Equilibria when layoffs are private information

We study in this section *perfect Bayesian equilibria* (PBE) under CPE-type long-term contracts without commitment. The crucial assumption is that workers have no information about, hence cannot condition their contract acceptance strategies on, the firm's layoff record.

In a screening PBE, θ_H-workers accept, while θ_L-workers reject, the firm's contract offer. A contract $\{w_t, w_{t+1}\}$ inducing a screening PBE should maximize the firm's present discounted profit

$$V = \theta_H - w_t + \beta(\theta_H - w_{t+1}) + \beta^2 V \tag{1}$$

subject to the following equilibrium constraints. The firm should find it optimal to continue with the worker at date $t + 1$ if $\theta = \theta_H$ is revealed ($\mu = 1$), to terminate

---

[8]Given that the workers accept no less than w_R, the firm's strategy to offer the contract $\{w_R\}$ is optimal, including its direction of this offer to the θ_H, incumbent, worker at date $t + k + 1$. Acceptance of these offers yielding the outside option wages are optimal for the workers.

employment and switch to an outside worker if $\theta = \theta_L$ is revealed. Thus, letting V^X denote the firm's discounted profit from termination of employment at the interim date, the following conditions must hold:

$$\theta_L - w_{t+1} + \beta V < V^X, \qquad\qquad (FII_L)$$

$$V^X \leq \theta_H - w_{t+1} + \beta V. \qquad\qquad (FII_H)$$

(FII_L), the firm's interim incentive constraint for the low-ability incumbent worker, ensures that the firm terminates the contract if $\theta = \theta_L$. Its analogue for the high-ability worker, (FII_H), ensures that the firm opts for continuation with the θ_H-worker.

The participation constraint of the θ_H-worker, assuming that the firm opts for continuation, requires discounted contract wages be at least as large as the discounted wages from the outside option,

$$w_t + \beta w_{t+1} \geq (1 + \beta) w_R. \qquad\qquad (PC_H)$$

Finally, given that the firm terminates the contract if the worker reveals $\theta = \theta_L$ as stipulated by (FII_L), θ_L-workers must reject the contract offer. This (non-participation) condition is expressed as

$$w_t < w_R. \qquad\qquad (NPC_L)$$

Combining (PC_H) and (NPC_L) yields the dynamics of the wages in a screening PBE, $w_t^* < w_R < w_{t+1}^*$. The firm pays a first-period wage below w_R to screen out θ_L-workers, but compensates the incumbent worker with a large second-period wage *if* demonstrated ability is θ_H.

The critical issue in the firm's problem is simultaneous satisfaction of (FII_L) and (FII_H), that is, feasibility of inducing termination with the θ_L-worker but continuation with the θ_H-worker. The contract involves no commitment for continuation and the second-period wage is above the workers' common outside option, thus the firm has an incentive to immediately switch at date $t + 1$ to outside workers by offering the same contract it did at date t (which θ_H-workers accepted). Whether it will do so is determined by V^X, the discounted profit the firm expects if it terminates the contract.

The following proposition states the PBE outcome under a CPE-type contract without commitment, if workers' acceptance strategies are history-independent.

8

Proposition 1 *Suppose that the firm's layoff record is its private information. The firm cannot induce a screening PBE through long-term contracts without commitment.*

The intuition is simple. Suppose, as under CPE contracts in the withdrawn French labor reform, workers can be dismissed without justification and that a screening PBE is played in which young workers accept a wage $w_t < w_R$ at all t, with the expectation that the firm will extend employment if $\theta = \theta_H$, terminate if $\theta = \theta_L$. Now, the firm will deviate to firing the incumbent worker no matter his observed ability, for it can guarantee hiring a new θ_H-worker and pay less for the next period, $w'_{t+1} = w_t < w_R$ (which is accepted, according to θ_H-workers' strategy). This deviation is better than keeping the incumbent θ_H-worker at the wage $w_{t+1} > w_R$. That CPE-type contracts could not produce an efficient screening outcome was noted, to our surprise, by media columnists. One commentator wrote, "under this new law, an employer will have an incentive to end employment before the two years are up and hire another employee who is under 26."[9]

4   Equilibria when layoffs are public information

We now drop the assumption in Proposition 1 and show that making layoffs public information can drastically change the equilibrium outcome. Suppose that a mechanism is instituted in conjunction with the CPE reform to inform workers about the firm's layoff record.

When the firm's layoff record is common knowledge, workers' individual contract acceptance strategies can depend on the layoff record: Young workers can now switch to rejecting below-the-market entry wage offers from a firm which is observed to prematurely terminate CPEs. They don't need an infinite collective memory and punish the firm forever. We say that workers have T-periods memory if they can condition their contract acceptance strategies on a record of past T periods. The following strategy profile produces the unique screening PBE outcome:[10]

---

[9]Ronda Hauben, in "French Youth Up in Arms Over New Labor Law," http//english.ohmynews.com/ArticleView/article_view.asp?no=279060&rel_no=1, published 2006-03-13.

[10]Though the screening PBE is not unique, the outcome is. Non-uniqueness of screening PBE is due to the fact that many employment contracts exist with wages satisfying the screening constraints introduced in section 3.

Public ratings strategies

- *The firm.* In even periods t, offer the contract $\{w_t, w_{t+1}\}$ that maximizes the objective in (1), subject to (FII_L), (FII_H), (PC_H) and (NPC_L). In odd periods, choose continuation if $\mu = 1$, terminate the contract if $\mu = 0$.

- *The workers.* Given a short-term contract offer, follow Kleenex strategies. Given a long-term contract offer, (i) if the firm has no record of layoff in the past T periods, θ_H-workers reject the contract offer at date t if $w_t + \beta w_{t+1} < (1+\beta)w_R$, accept otherwise. θ_L-workers reject the contract if $w_t \leq w_R$, accept otherwise. (ii) If there is a layoff at date t, follow Kleenex strategies for T periods and play the strategy in (i) above from period $t + T + 1$ on.

According to these strategies, the firm offers an ascending wage profile which high-ability workers accept and low-ability workers reject. If the firm deviates and terminates prematurely a screening long-term contract at any interim date, workers start following their Kleenex strategy for T periods, following which they revert back to their Public Ratings strategies. A possible interpretation of this reaction is that workers start viewing the firm as a "short-term player" and reject any wage for the immediate period below their outside option wage. The time period T can be interpreted as the workers' memory of the firm's layoff history. During this "punishment phase" the firm suffers a loss of expected profits which is large enough to prevent its initial deviation.

Proposition 2 *Suppose that the firm's layoff record is common knowledge. There exists a minimum number of periods τ, strictly positive, such that public ratings strategies constitute a PBE for $T \geq \tau$. This equilibrium is efficient, the firm obtains the maximal discounted profit $V^* = \overline{V}$ and acceptance strategies of workers with memory T depend on the firm's layoff history.*

The proof is in the Appendix. Along the screening equilibrium path the firm does not fire any worker, but the threat to fire low-ability workers is credible and will be exercised, as guaranteed by the constraint (FII_L). The incumbent θ_H-worker obtains the discounted payoff $w_t^* + \beta w_{t+1}^* = (1+\beta)w_R$, the equivalent of the per-period wage w_R. Therefore switching to Kleenex strategies is costless for the workers. Without this switch the firm could obtain a discounted profit larger than $\overline{V}$ by always deviating to terminating the contract, which θ_H-workers will foresee

10

and reject the long-term screening contract at the outset. The workers' Public Ratings strategy is beneficial for the firm because its screening equilibrium profit is larger than its profit in a nonscreening equilibrium. Screening considerations gain importance as the differential ability $\theta_H - \theta_L$ increases. The larger this gap, the larger the benefits generated by workers' potential reactions to layoffs.

The most important step in mapping this theoretical result to the French labor reform context is informed workers' reaction to layoffs. Will they "punish" high-layoff firms by raising as in the equilibrium in Proposition 2 their firm-specific reservation wages? There are strong indicators that the answer is "yes." If workers did not react to layoffs, high-layoff jobs would not pay more on average than low-layoff jobs. Studies show that high layoff and turnover rates can easily change a firm's reputation. Ryan (1994), for instance, makes a similar observation in the context of trainee labor in the UK, noting that firms exploiting trainee labor will destroy their reputation and ability to attract workers because "ex-trainees who have acquired information on the merits of their training inform potential successors of its quality." This, in turn, leads firms to value their reputations on treatment of trainee labor, as the firm in our model values its reputation by promoting its high-ability worker. What can be termed "exploitative" probation could well trigger a phase during which the firm finds it very difficult to attract suitable young workers unless it increases the entry-level wage. Now, to produce this reactive strategy, workers have to be informed about firms' layoff practices. Because individual players in the labor markets will fail to effectively collect, process and transmit the information about firms' practice with CPEs, we propose a centrally administered institutional mechanism.

5   Conclusion

Firms have to use probationary contracts to screen out unsuitable workers. However, the same probationary contract produces an incentive for the firm to terminate too soon, too often, even if the worker proves to be of a suitable type, if the firm has the right to terminate at no cost, without justification.

We identify an environment in which a CPE-type contract can produce this kind of "exploitative screening" outcome and, in the words of its opponents, become a Kleenex contract. We argue that the efficient screening outcome would be

restored if in conjunction with the CPE reform a mechanism is instituted to inform workers about firms' layoff records. Fearing informed workers' reaction to exploitative screening, firms would use their termination option with restraint, only if the worker reveals an unsuitable type. It is worth emphasizing that the model which we use to justify our prescription has quite standard features: noncontractible labor performance, asymmetric information about workers' firm-specific abilities and contract forms that closely mimic the French context, including CPE's (long-term, no commitment), CDIs (long-term, commitment) and temporary contracts (short-term). The French labor reform package would probably not have prompted the reaction it did, we believe, had the CPE been introduced along with an institution in charge of informing workers about firms' layoff practices and the public been informed about the purpose of the new institution.

Appendix

Proof of Proposition 2

Define the discounted profit $V^X(T)$ as the payoff the firm would get from the play of Kleenex strategies for T periods, to which the discounted profit $\overline{V}$ is attached $T+1$ periods ahead. For instance, for $T = 2$,

$$V^X(2) = (1 + \beta(1-\pi))(\theta_E - w_R) + \beta\pi(\theta_H - w_R) + \beta^2\overline{V}.$$

The expression of the discounted payoff $V^X(T)$ depends on whether T is odd or even, because along the play of Kleenex strategies the firm uses short-term non-screening contracts which are not extended if the incumbent turns out to be of type θ_L. Let $V_E^X(T)$ and $V_O^X(T)$ denote respectively the payoff $V^X(T)$ for T even and odd, with $V_E^X(0) = V_O^X(0) = \overline{V}$. We have

$$V_E^X(T) = \theta_E - w_R + \beta[(1-\pi)V_O^X(T-1) + \pi(\theta_H - w_R + \beta V_E^X(T-2))]$$

where for $T = 2$, $V_E^X(T-2)$ should be replaced by $\overline{V}$. As for T odd, we have $V_O^X(1) = \theta_E - w_R + \beta\overline{V}$ and for $T \geq 3$,

$$V_O^X(T) = \theta_E - w_R + \beta[(1-\pi)V_E^X(T-1) + \pi(\theta_H - w_R + \beta V_O^X(T-2))].$$

Note that for *any* $T > 0$ odd or even, the firm's discounted profit $V^X(T)$ from terminating a long term contract is strictly smaller than $\overline{V}$. Moreover, for $i = E, O$, $V_i^X(T) < V_i^X(T-2)$, therefore the payoff $V^X(T)$ is decreasing in T. During the

play of Kleenex strategies the firm gets the profit $\theta_H - w_R$ only in periods where the worker hired in the previous period turns out to be of type θ_H; the firm contends itself with the smaller profit $\theta_E - w_R$ in all other periods. The shorter T, the sooner the firm starts receiving the maximal per-period profit $\theta_H - w_R$ and the closer $V^X(T)$ gets to $\overline{V}$.

Consider now Public Ratings strategies and the firm at the interim date, between period t and $t + 1$. Its discounted profits from continuation can be written as $\theta_H - w_{t+1} + \beta \overline{V}$, which is smaller than $\overline{V}$ because $w_{t+1} > w_R$. Clearly, for T large enough,

$$\theta_H - w_{t+1} + \beta \overline{V} \geq V_i^X(T), \quad i = E, O.$$

We define τ as the smallest $T \geq 0$ satisfying this equation.

Given any $T \geq \tau$, we define lower and upper bounds for w_{t+1}, as $\underline{w}(T) = \theta_L - V_i^X(T) + \beta \overline{V}$ and $\overline{w}(T) = \theta_H - V_i^X(T) + \beta \overline{V}$ through, respectively, (FII_L) and (FII_H) stated as equalities. If the (second-period) wage w_{t+1} is higher than $\overline{w}(T)$, the firm prefers terminating the long-term contract of an incumbent θ_H-worker despite the potential reaction of workers in the continuation equilibrium, to reject a wage less than w_R for each of the T periods ahead. Thus, in a screening equilibrium we must have $w_{t+1} \leq \overline{w}(T)$. Note that $V_i^X(T) < \overline{V}$ implies $\overline{w}(T) > w_R$. On the other hand, if w_{t+1} is below $\underline{w}(T)$, the firm will ex-post prefer continuation with even a θ_L-type incumbent and, as this will be anticipated by θ_L-workers, the initial contract offer will either be accepted by all workers or none, hence, perform no screening.

We now claim that in any screening PBE, θ_H-workers' participation constraint (PC_H) must be binding. Suppose not, so that $w_t + \beta w_{t+1} > (1 + \beta) w_R$, and consider the following modification in the wages for t and $t+1$: decrease w_t by ε and increase w_{t+1} by $\beta \varepsilon$, which reduces the firm's discounted wage bill by $(1 - \beta^2)\, \varepsilon$. Solving (1) for $V = [\theta_H - w_t + \beta(\theta_H - w_{t+1})]/(1 - \beta^2)$ and using this payoff expression in (FII_H) and (FII_L), observe that the wage modification above does not violate these constraints. Nor is (NPC_L) affected. Thus ε can be chosen to have (PC_H) satisfied with equality, $w_t + \beta w_{t+1} = (1 + \beta) w_R$, which is optimal for the firm given workers' acceptance strategies.

Using this fact, the firm's screening PBE objective function in (1) can be written as

$$V = \theta_H - w_R + \beta V,$$

which is independent of the choice variables w_t and w_{t+1}. Therefore existence of wages w_t and w_{t+1} that satisfy the constraints (FII_H), (FII_L), (NPC_L) and (PC_H) will imply existence of a screening PBE. Showing this is a straightforward exercise. Pick w_{t+1}^* from the interval $(max\{w_R, \underline{w}(T)\}, \overline{w}(T)]$ and set $w_t^* = w_R - (1+\beta)(w_{t+1}^* - w_R)$. Note that $w_t^* < w_R < w_{t+1}^*$ and all equilibrium constraints are satisfied.[11]   **Q.E.D.**

References

[1] Bac, M. (2000) "On-the-Job Specific Training and Efficient Screening," *Journal of Labor Economics* **18** 681-701.

[2] Becker, G. (1964) *Human Capital* University of Chicago Press, Chicago.

[3] Becker, G. (2006) "Comment on the French Employment Law Riots," at http://www.becker-posner-blog.com/archives/2006/03/comment_on_the_2.html

[4] Jovanovic, B. (1979) "Job Matching and the Theory of Labor Turnover," *Journal of Political Economy* **87**

[5] Khandker, R.K. (1992) "A Model of Layoff, Search and Job Choice and its Estimation," *Review of Economics and Statistics* **74** 269-277.

[6] Krueger, A. and Summers, L., (1988) "Efficiency Wages and the Inter-industry Wage Structure," *Econometrica* **56** 259-293.

[7] Lazear, E.P. (1979) "Why is there Mandatory Retirement?" *Journal of Political Economy* **87** 1261-1284.

[8] Lazear, E.P. and Oyer, P. (2004) "Internal and External Labor Markets: A Personnel Economics Approach," *Labour Economics* **11** 527-554.

[9] McCall, B.P., "The Effect of Job Heterogeneity on Reservation Wages," *International Economic Review* **35** 773-791.

---

[11] The interval from which w_{t+1}^* can be chosen becomes larger as T increases, essentially because a longer duration for the play of Kleenex strategies increases the firm's layoff cost and allows it to credibly offer a "steeper" wage profile.

[10] Mortensen, D. and Pissarides, C., (1999) "New Developments in Models of Search in the Labor Market," Chapter 39 in *Handbook of Labor Economics* Vol. 3B, 2567-2627.

[11] Ryan, P. (1994) "Training Quality and Trainee Exploitation," in *Britain's Training Deficit*, eds. R. Layard, K. Mayhew and B. Owen., Aldershot, Avebury, pp. 92-124.

[12] Waldman, M. (1984) "Job Assignments, Signaling and Efficiency," *RAND Journal of Economics* **15** (2), 255-270.

[13] Wright, R. (1987) "Search, Layoffs and Reservation Wages," *Journal of Labor Economics* **5**, 354-365