Severance Pay and the Accuracy of Judgment∗

Kenji AZETSU† Taro KUMAGAI‡

January 2005

Abstract

This paper investigates the effects of a severance pay on the level of effort, the payment for workers and the level of employment with dismissal conflicts. We show that the effects of increasing a severance pay depend on the sensitivity of the judgment on the effort chosen by workers when the judgment may be incorrect.

Keywords: Efficiency wages; Severance pay; Accuracy of Judgment

JEL Classification: J41, J65.

1 Introduction

The firing costs are often accused as cause of high unemployment rate in Europe. An increase in the firing costs such a severance payments and remedies following unjustified dismissal generally makes shirking more attractive, so that the efficiency wage raises and the firm reduces the level of employment1. Most efficiency wage models have predicted this result. Despite this prediction, a severance payment and remedies following unjustified dismissal increase in France

∗We are grateful to Tetsuya Kishimoto, Reishi Maruya, Takeshi Nakatani, Tamotsu Nakamura, and the participants at the conferences of Japanese Economic Association (JEA) September, 2005 and Japan Economic Policy Association (JEPA) on March, 2005.
†Graduate School of Economics, Kobe University, Rokkodai-cho 2-1, Nada-ku, Kobe 657-8501, JAPAN. Email: 018d201e@y01.kobe-u.ac.jp
‡Graduate School of Economics, Kobe University, Rokkodai-cho 2-1, Nada-ku, Kobe 657-8501, JAPAN. Email: kumagai@econ.kobe-u.ac.jp

1In efficiency wage models, firms use premium regarding the imperfect observation for workers' effort. Shirking can be prevented by threat of being fired and therefore losing the wage premium. See, for example, Shapiro and Stiglitz (1984).
and the United Kingdom\textsuperscript{2}. In the viewpoint of efficiency wage models, these reforms will raise unemployment. Why were these reforms enforced?

In many countries, employment protection legislation requires firms to compensate workers with a severance payment when firing them for economic reasons. However, firms have no obligation to pay the compensation to workers for disciplinary reasons. Whether the reasons for dismissal is cogent is judged by the court when the fired worker complains. We analyze the circumstance in which an effort the workers made is imperfectly observable and individually dismissal conflicts in which the fired worker can go to court. In this situation, due to asymmetric information, the disciplinary dismissals may be costly while the dismissals for economic reasons may have no cost. Gardón-Sánchez and Güell (2003) introduced this situation first and studied the effect on the level of employment through the increase in a severance pay. They concluded that the increase in a severance pay reduces the level of employment. This result depends on the assumption that the worker wins the case with the equal probability regardless of the level of an effort he/she made. Under this assumption, the increase in a severance pay gives workers an incentive to shirk. Therefore, the firm must raise the wage to deter shirking, and the level of employment reduces.

Their assumption may be contentious. We suppose that the level of effort chosen by workers influences on the judgment, and examine the effect on the level of employment when a severance pay increases. We show that an increase in a severance pay may raise the level of employment. This result depends on the accuracy of judgment. When the court appropriately adjudges the worker’s effort, the increase in a severance payment reduces the shirker’s expected benefit. Therefore, when a severance pay increases, the firm can lower the wage and increase the level of employment since the worker have an incentive to make an effort. This is a kind of the bonding mechanism\textsuperscript{3}. When the bonding mechanism is effective, the increase in a severance pay has a positive effect on the level of employment.

This paper is organized as follows. Section 2 constructs and analyzes the shirking model with the dismissal conflicts between the firm and workers. Section 3 shows the effects of the

\textsuperscript{2}In France, the severance pay twice in 2002: 1/5th of month’s pay per year of service plus an additional 2/15th after 10years. In the United Kingdom, compensatory award is raised from £12,000 to £50,000.

\textsuperscript{3}Bonding occurs when the firm requires each new worker to post a bond that must be forfeited if he/she is caught shirking. By requiring sufficiently large bonds, the firm can induce workers not to shirk without paying the premium wage. See, for example Carmichael (1985).
change of a severance pay. Section 4 gives the concluding remarks.

2 The Model

We consider a continuous-time model. Workers are risk neutral, homogeneous and infinitely lived. Their instantaneous utility function is $u(w, e) = w - d(e)$, where $w$ is the level of wage. $d(e)$ denotes their cost of providing effort, where $d(0) = 0$, $d'(e) > 0$ and $d''(e) > 0$.

The firm pays the wage to workers, and requires them to make an effort $e > 0$ in each period. The firm can observe workers’ effort with a rate $q$. If the firm observes $e < \bar{e}$, it thinks of worker as shirker and can dismiss her for neglect of duty without additional costs. The firm also fires the worker without the redundancy reason with a rate $b$. These implies that the worker is fired with $b$ when he/she chooses $e \geq \bar{e}$ and with $b + q$ when he/she chooses $e < \bar{e}$. Therefore, the worker’s problem is to choose $e = \{0, \bar{e}\}$.

When the fired worker brings a suit against the firm, the court judges the case whether the dismissal is fair or unfair, based on the evidence brought by the firm. If the dismissal is regarded as unfair, the firm must incur the severance pay $C > 0$. If the dismissal is regarded as fair, the firm can dismiss the worker without additional costs. The judgment is stochastic, because the court does not have perfect information for the level of effort the worker chose. The worker wins the case with a probability $p_N$ if the worker chooses $e = \bar{e}$, while a probability $p_S$ if the worker chooses $e = 0$. $p_N > p_S$. $p_N$ closes to 1 ($p_S$ closes to 0) as the court have more information for effort taken by the worker. $p_N$ is equal to $p_S$ as the third party have no information.

Under these circumstances, there may be a double moral hazard problem. The firm may be able to save $C$ when the firm always fires without a dismissal pay, and the worker may be able to get $C$ when he/she always asserts unfair dismissal. As the result, whenever the firm fires workers, the conflicts between the firm and workers bring up\(^4\). We concentrate on the case in which there is a double moral hazard problem whenever workers are dismissed.

Let us define $V^N$ and $V^S$ respectively as the expected lifetime utility of an employed no-shirker ($e = \bar{e}$) and an employed shirker ($e = 0$). As in Shapiro and Stiglitz (1984), fundamental

\(^4\)To simplify the analysis, we assume each party have no litigation cost. If the litigation cost is sufficiently high, the worker may not, necessarily, take the firm to court, and litigation cost affected the structure of net expected gain from the conflicts for each party.
asset equation $V^N$ and $V^S$ satisfies

\begin{align}
    rV^N &= w - d(\bar{e}) + b(V^U + p_N C - V^N), \\
    rV^S &= w + (b + q)(V^U + p_S C - V^S),
\end{align}

where $r$ is discount rate and $V^U$ is the workers’ reservation utility. If $V^N \geq V^S$ is satisfied, the workers make an effort $\bar{e}$. Using (1) and (2), the incentive compatibility condition can be written as

\begin{align}
    \hat{w} \geq \alpha d(\bar{e}) + (r + b)T + rV^U \equiv \hat{w}_I(\bar{e}),
\end{align}

where $\hat{w} = w + bp_N C$, $\alpha \equiv (r + b + q)/q > 1$ and $T \equiv \{(b + q)p_S - bp_N\}C/q$. $\hat{w}$ is the average payment of all employee including current fired person. $T$ is the difference in the expected dismissal pay between shirker and no-shirker before they are fired. The value of $T$ may be small when the court has much information for workers’ effort. If the court has perfect information ($p_N = 1$ and $p_S = 0$), $T$ is equal to $-bC/q < 0$. And if the court has no information ($p_N = p_S = p$), $T$ is $pC > 0$.

The participation condition, $V^N \geq V^U$ is written as

\begin{align}
    \hat{w} \geq d(\bar{e}) + rV^U \equiv \hat{w}_P(\bar{e}).
\end{align}

The firm solves the following problem subject to (IC) and (PC).

\begin{align}
    \max_{w,e,L} \quad g(\bar{e}L) - \hat{w}L,
\end{align}

where $L$ is the level of employment and $g(\bar{e}L)$ is production function with $g'(\bar{e}L) > 0$ and $g''(\bar{e}L) < 0$. Note that outputs depend on the quantity of effective labor $\bar{e}L$. The firm therefore wants to hire effective labor as cheaply as possible.

As shown by Solow (1979), this maximization problem is solved by the following two steps. First, the required level of effort $\bar{e}$ and the average payment $\hat{w}$ are determined as minimizing the unit cost of the effective labor $\hat{w}/\bar{e}$ subject to (IC) and (PC). Next, the level of employment $L$ is determined from equalizing the marginal productivity of the effective labor and the unit cost of the effective labor, which has been minimized at the first step:

\begin{align}
    g'(\bar{e}L) = \frac{\hat{w}}{\bar{e}}.
\end{align}

The difference between (IC) and (PC) depends on the sign of $d(\bar{e})/q + T$. Therefore, which constraint binds depends on the value of $T$ and $\bar{e}$. The sufficiently small value of $T$ implies that
the court has much information on workers’ effort and then (PC) binds. On the other hand, the high value of $T$ implies that the third party has less information. In this case, (IC) binds. Notice that there is the intermediate value of $T$ such that both constraints may be binding. In the following, we characterize the solution in each case.

Case 1: Only (PC) is binding

Solving (PC) with equality, the firm’s problem becomes minimizing the unit cost of effective labor $w_P(\bar{e})/\bar{e}$ over $\bar{e}$. The optimal required level of effort $\bar{e}_P^*$, therefore, satisfies

$$d'(\bar{e}_P^*)\bar{e}_P^* = d(\bar{e}_P^*) + rV^U, \quad (4)$$

which states that the increase of disutility in adding the required level of effort must be equal to the unit cost of effective labor. The optimal average payment is $\hat{w}_P^* = d(\bar{e}_P^*) + rV^U$. Given $\bar{e}_P^*$ and $\hat{w}_P^*$, the optimal level of employment $L^*_P$ is determined by (3).

Case 2: Both Constraints are binding

What both (PC) and (IC) bind implies is that the optimal required level of effort $\bar{e}_B^*$ is determined by $w_P(\bar{e}_B^*) = w_I(\bar{e}_B^*)$, that is

$$\frac{d(\bar{e}_B^*)}{q} + T = 0. \quad (5)$$

In this case, the value of $T$ must be negative since $d(\bar{e}_B^*)/q$ is positive. The optimal average payment of labor is $\hat{w}_B^* = d(\bar{e}_B^*) + rV^U = ad(\bar{e}_B^*) + (r + b)T + rV^U$.

Case 3: Only (IC) is binding

Finally, consider the case in which the value of $T$ is sufficiently high, i.e. only (IC) is binding. Solving (IC) with equality, the firm’s problem is minimizing $w_I(\bar{e})/\bar{e}$. The optimal required level of effort $\bar{e}_I^*$ satisfies the following:

$$ad'(\bar{e}_I^*)\bar{e}_I^* = ad(\bar{e}_I^*) + rV^U + (r + b)T. \quad (6)$$

The average payment of labor then is $\hat{w}_I^* = ad(\bar{e}_I^*) + (r + b)T + rV^U$.

We characterize the sign of $T$. There exists $T_1$ that satisfies $\bar{e}_P^* = \bar{e}_B^*$, that is $d(\bar{e}_P^*)/q + T_1 = 0$, so that only (PC) must be binding if $T < T_1$. Also, there exists $T_2$ that satisfies $\bar{e}_B^* = \bar{e}_I^*$, that is
\( d(\tau^*_i)/q + T_2 = 0 \). Only (IC) must be binding if \( T > T_2 \). If \( T_1 \leq T \leq T_2 \), both constraints must be binding. Note that \( T_2 \) is the negative value since \( \pi^*_B > 0 \) and \( T_2 \) satisfies (5).

When the value of \( T \) is sufficiently small, the court can relatively make the accurate judgment, whether the dismissal is fair or unfair. This implies that the effort workers made is likely to be recognized. Therefore, the sufficiently small \( T \) gives workers a strong incentive to make an effort, and only (PC) binds. On the other hand, with the high value of \( T \), the judgment may be incorrect, that is, workers’ effort may go to waste. Therefore, the high value of \( T \) discourages workers from making an effort and only (IC) binds. In the following section, it becomes clear that the value of \( T \) plays an important role in the change of a severance pay.

\section{The Effects of Changing Severance Pay}

In this section, we study the effects on the change of a severance pay in each case. Note that the sign of \( T_C \equiv \partial T/\partial C \) is important for the results of comparative statics. In case 3, \( T_C \) may be positive or negative, while it is always negative in case 1 and case 2.

\textbf{Case 1}

A severance pay scheme sufficiently provides no-shirking incentive for workers (\( T \) is sufficiently small). Therefore, the problem to provide the workers with no-shirking incentive is no longer important. Since the optimal solution does not depend on \( T \), the change of a severance pay \( C \) has no effect on all argument, \( \pi^*_p \), \( \hat{w}^*_p \), and \( L^*_p \).

\textbf{Case 2}

In this case, \( T_C \) is negative since \( T \) is negative. When a severance pay \( C \) increases, from (5)

\[
\frac{d\pi^*_B}{dC} = -\frac{qT_C}{d(\pi^*_B)} > 0. \tag{7}
\]

The increase in \( C \) thus has the positive effect on the optimal required level of effort. The increase in \( C \) has the following effect on the average payment:

\[
\frac{d\hat{w}^*_B}{dC} = d'(\pi^*_B) \frac{d\pi^*_B}{dC} > 0.
\]

The firm pays the higher wage to workers and requires his/her to provide level of effort when \( C \) increases. However, the effect on the unit cost of effective labor is unambiguous. When \( C \)
increases, the effect on the unit cost of effective labor $\hat{w}_B^*/\bar{e}_B^*$ is as follows:

$$\frac{d(\hat{w}_B^*/\bar{e}_B^*)}{dC} = \frac{1}{(\bar{e}_B^*)^2}[d'(\bar{e}_B^*)\bar{e}_B^* - (d(\bar{e}_B^*) + rV^U)]\frac{d\bar{e}_B^*}{dC},$$

(8)

Since $\bar{e}_B^* \leq \bar{e}_P^*$, the sign of the square bracket of (8) is negative. From (7), therefore, (8) is negative and is equal to 0 only when $T = T_1$. This implies that the effective labor $e_B^*L_B^*$ increases. Since $\bar{e}_B^*$ increases, the effect on the level of employment is ambiguous when $C$ increases.

**Case 3**

First, we examine how $T$ has the effects on each variables, since $T_C$ may be positive or negative in this case. From (6), the required level of effort is affected as follows:

$$\frac{d\bar{e}_I^*}{dT} = \frac{r + b}{\alpha d''(\bar{e}_I^*)}\bar{e}_I^* > 0.$$

Thus a severance pay increases the required level of effort if $T_C > 0$ and decreases if $T_C < 0$. We can easily confirm that $\hat{w}_I^*$ also raises (lowers), when $T_C > 0$ ($T_C < 0$).

The increase of $T$ has positive effect on the unit cost of effective labor $\hat{w}_I^*/\bar{e}_I^*$ by envelope theorem. When $T_C > 0$, the unit cost increases and then the effective labor $\bar{e}_I^*L_I^*$ decreases. Therefore the level of employment lowers since $\bar{e}_I^*$ increases. On the other hand, the unit cost of effective labor decreases, and the effective labor decreases when $T_C \leq 0$. Then $L_I^*$ increases since $\bar{e}_I^*$ decreases.

### 4 Concluding Remarks

This article analyzed the effect of a severance pay on the workers’ effort, the average payment of labor and the level of employment. The framework was based on the standard efficiency wage model by Shapiro and Stiglitz (1984), and extended to take account of dismissal conflicts. Since the court does not have perfect information on workers’ effort, the judgment for the conflict may be incorrect.

We showed that the effects of increasing a severance pay on the level of effort, the payment for workers and the level of employment depend on the accuracy of judgment. If the court has

---

5We have already known that $\bar{e}_P^*$ does not depend on $T$. When $T$ gets to $T_1$, $\bar{e}_P^*$ is equal $\bar{e}_B^*$ at the point, and subsequently, $\bar{e}_B^*$ lowers as $T$ increases. Therefore $\bar{e}_B^* \leq \bar{e}_P^*$ is always satisfied. This means that $d'(\bar{e}_B^*)\bar{e}_B^* \leq d(\bar{e}_B^*) + rV^U$ holds from (4).

---

7
sufficiently information on workers’ effort, the judge can relatively make an accurate judgment on whether the dismissal is fair or unfair. This implies that no-shirking workers fired are likely to be admired for their effort. Then a severance pay system provides workers a strong incentive to make an effort. On the other hand, if the court has little information on workers’ effort, shirking workers fired may not be blamed for their idling. Then a severance pay system gives workers an incentive to shirk.

References


