The expectation measure, labor contracts, and the incentive to work hard

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Abstract

Under American or Dutch law, employees who leave the firm earlier than expected do not have to compensate the employer for lost profits in most cases. This conflicts with the general view in law and economics scholarship that the expectation measure is the superior remedy.

We argue that the promisee (the employer) should not be awarded compensation for lost expected profits if the promisor (the employee) can vary his level of effort, which is a typical feature of labor contracts. The ex post expectation measure undermines the incentives to work hard (i.e., above the defined minimum level) because the higher the employee’s productivity, the higher the expected lost profits for the employer in case of breach.

Our conclusion holds even if the first employer earned rents, or if the employee likes to work, or if courts undercompensate. The ex post expectation measure improves the employee’s incentives only if markets seriously overreact to productivity signals.

We also analyze the incentive properties of 3 alternative expectation measures. The ex ante minimally expected profits measure does not change the incentives to work hard, but if the expectation measure is defined in terms of potential (maximal) or optimal productivity, the incentive to work hard is seriously undermined. We also show that the ex post expectation measure may create unemployment in that it inefficiently deters employees from entering into labor contracts.

Contrary to the current view in law and economics scholarship we show that the expectation measure can be a barrier to efficient breaching. It destroys the information necessary for efficient breach by undermining the employees’ incentives to signal on the market how productive they can be. As a consequence, competing employers no longer receive the information they need to make better proposals. © 2001 Elsevier Science Inc. All rights reserved.

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1. Introduction

The economic literature on general contract law has examined the effect of the major remedies on the parties’ decisions to breach, to make reliance and precaution costs, and to enter into a contract. Law & economics scholars generally consider the expectation measure as the superior remedy, because of the incentives it creates for optimal breaching decisions. This viewpoint corresponds to the position of the expectation measure as the standard remedy under Anglo-American as well as continental law.1

Yet one major unexplained puzzle in the literature is why the expectation measure is not the standard remedy in labor law. The expectation measure awards compensation for both the expected profits and the reliance costs of the promisee. However, in labor law employees who leave the firm earlier than expected do not have to compensate the employer for the profits he expected to make (and not even for his reliance costs such as his investments in the human capital of the employee and the wasted transaction costs).

This holds for both American and Dutch labor law. The traditional American approach is to treat a contract of employment without specified duration as a contract terminable at will by either side for good cause, bad cause or no cause at all.2 In general, employees have a right to quit employment without having to provide any reason or to pay compensation.3 At first sight the situation is different for employment contracts for a specific period of time (which are not common in the U.S.A.) It is mostly adopted for employees with a unique talent like actors or performers.4 If an employee terminates an employment contract before its expiration (without a good reason), the employer is entitled to recover for any loss incurred as a result of that breach of contract. But the employer is under a general duty to mitigate damages by finding a replacement employee. In order to compute the compensation to the employer for lost benefits, courts generally only compare wages. If the newly hired employee is paid the same wage, but has a lower effort level (which decreases the profits to the firm), the employer will not be granted any compensation. If effort levels were to be taken into consideration, it would be concluded that the employer suffers losses due to the reduced effort level. Courts generally do not take into account the effort level of the employees.

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1 For continental law, see for instance art. 6:96 Dutch Civil Code and art. 1149 of the French and Belgian Civil Code.
3 The overriding concern is the employee’s constitutional right to quit employment (Rothstein, M. et al. eds, Employment law, volume 2, St.Paul, MN, West, 1994, 178). The employment-at-will doctrine is not absolute as almost every state recognizes various legislative and judicially defined exceptions to its application (Littler, Mendelson, Fastiff, Tichy & Mathiason, Fundamentals of employment law, Chicago, Tort and Insurance Practice Section, American Bar Association, 1994, 209). Yet, American courts allow an employer to sue an employee for damages for breach of an employment contract due to quitting in exceptional cases only, where the employees have exploited the employer’s immediate dependency upon them by quitting precipitously. (Id. at 179.) These exceptions seem to aim at discouraging hold-ups by employees or making them inform the employer about their plans beforehand, but not at discouraging inefficient breaches in general.
4 For American law, see for instance Goldman, A., o.c., 133–153; Rothstein, M. et al. eds, Employment law, volume 2, par. 8.1.
Under Dutch labor law a similar distinction is made between an employment contract for an indefinite period of time and the employment contract for a fixed period of time. An employment agreement for an indefinite period of time may be terminated without compensation if the statutory notice period is respected (art. 7:669 C.C.). If the employee does not comply with the applicable notice period, the sanction is in no way related to the actual lost profits: statutory damages are equal to the amount of the employee’s salary for the number of days that regular notice would have required (art. 7:680 par.1 C.C.). If the employee terminates an employment agreement for a fixed period before its expiration, the sanction is similar and again not related to the lost profits: the damages are equal to the amount of the employee’s wage from the day of premature termination until the final date previously agreed upon.

Is there any economic reason why the general rules for contract breach should not be applicable to labor relationships? Are there any reasons why the standard law and economics models would not hold for labor contracts?

In this paper we will analyze how expectation damages influence the incentives to work hard. Labor contracts differ from spot contracts in that the promisor can vary his effort to some extent. In a typical labor contract, the employee will get a fixed wage and is obliged to perform at a defined minimum level. If he works less, he will be dismissed. But well-motivated workers perform above this minimal level. They may do so (a) because they love their jobs or (b) they want to signal to other employers that they are more productive than the average worker in order to get a better-paid job in the future.

In this paper we will argue that the promisee (the employer) should not be awarded compensation for lost expected profits if the promisor (the employee) can vary his level of effort. The expectation measure undermines the incentives to work hard.

The underlying intuition is as follows. The higher the employee’s productivity, the higher the expected profits for the employer will be. Hard working employees who want to leave the firm will have to pay higher damages than lazy employees. As a matter of fact, the expectation measure can be seen as a taxation on the surplus productivity, to be paid only if the employee moves to another firm. This situation can put the employee in a dilemma. If an employee thinks he has a good chance to get more attractive offers from other employers in the near future, he has an incentive to work not too hard. But if he slows down his productivity to avoid high damages upon breach, he may not get such attractive offers, because a competing employer might not think he is a good worker. So a crucial element of the model will be this signaling factor: to what extent will the productivity in period 1 be taken into account by competing employers who offer a job in period 2?

Suppose a secretary is paid for 40 hours of labor a week, but is extremely hard working and has a productivity that is twice as high as average. If he leaves the firm, it will be a great loss for the firm: they will have to replace him by two secretaries (with a normal produc-
tivity). Under the expectation measure he will have to compensate the employer for this loss and pay the wage of the second secretary. Suppose a new job is offered that is completely similar except for the fact that the new employer pays 90% more (because the second employer has observed the exceptional productivity of the employee). If he accepts that job, his net income (after having paid the sanction for contract breach) will be lower than it was before. To avoid these damages, he may decide to work less hard in the first period. But as a consequence the second employer may never find out how productive the employee really can be.

Under current labor law a hard working, ambitious employee will choose the following strategy. He will sign the contract and work the first year at the lower wage. But he will work hard to signal his higher than average productivity to other employers. As soon as he gets a better offer he will quit the firm (or renegotiate his wage), without obligation to pay damages. In general terms, we find the following paradox: the expectation measure, by awarding compensation for the employer’s lost profits in period 2, may destroy the profit in period 1.

This article is organized as follows. In section 2, we will explain the general model. In section 3 we will analyze the effort level under the perfectly enforced ex post expectation measure and try to determine under what condition this remedy undermines the employee’s incentive to work hard. In sections 4, 5 and 6 we will investigate whether our findings still hold when the signaling factor differs from 1, when courts undercompensate the losses (which is a realistic assumption), and when employees enjoy their work. Though the ex post expectation measure is the normal variant we will analyze in section 7 whether our findings would still hold if courts were to apply alternative variants of the expectation measure. In section 8 we will focus on the employee’s decision to enter into the first contract and the competing employer’s decision to offer a better contract. The article ends with some general conclusions (section 9).

2. Model description

2.1. Basic model

At date 1 the employee E has signed a contract to work for employer R₁ during a fixed duration of two equal periods (for instance two years).

The employee has to decide how hard he will work in period 1, that is, decide on his effort level \( e \). The employee should at least reach productivity level \( P₀ \), otherwise he will be dismissed immediately. He receives a wage, \( W₁ \), which is fixed: if the employee’s productivity is higher than \( P₀ \), the current employer will not pay him a higher wage. The wage \( W₁ \)

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7 Under Dutch law for instance, the extent of the damages is determined through a comparison of the actual situation and the (hypothetical) situation in which there would not have been a breach of contract. The moment of breach of contract is decisive to determine the extent of the loss for which damages will be given. ASSER, C. and HARTKAMP, A., *Verbintenissenrecht, dl I*, Zwolle, Tjeenk Willink, 1996, n.415. Therefore the time by reference of which damages are assessed is not the moment of the conclusion of the contract; the assessment is ex post, not *ex ante*. 
equals the minimal productivity $P_0$ (if the employer has no rents) or which is lower than $P_0$ (if the employer receives rent $r$, which of course presupposes some market power at the side of the employer).

At date 2, in the middle of the first contract, an alternative contract is offered by a competing employer $R_2$, who has observed the employee’s performance in period 1. We assume that the minimally required amount of job pleasure ($e_2$) is the same in both jobs in period 2. If the productivity in the first period ($P_1$) was $P_0$ then the offered wage equals $P_0$ (which will equal $W_1$ unless the first employer had initial rents, $r > 0$). But if the employee has worked harder than he had to ($P_1 > P_0$), employer B will offer a better contract than $P_0$. In other words, by working hard the employee signals his high productivity on the labor market. How much higher the offered wage ($W_2$) will be, depends on how well employer B can observe the employee’s productivity. We will define $s$, the signaling factor, as the relationship between the wage increase $W_2 - P_0$ and the productivity increase $P_1 - P_0$. If the employer $R_2$ cannot observe productivity increases, then we will assume that he will offer a wage which equals $P_0$ so that $s = 0$. (For the sake of simplicity, if the wages offered by both employers are equal, we will assume the employee will prefer not to change jobs). Modified Model (Section 8 only): the employee still has to decide whether or not to sign the first contract; there is a chance $p$ that later a better contract will be offered for period 2 by an employer who could not observe the employee’s productivity in period 1.

While in sections 3–7 we analyzed whether the employee would decide to work hard in period 1, given the fact that he had already signed the contract, we will go back in time in section 8 and analyze whether the employee will sign the first contract at all.8 If he doesn’t, he stays unemployed in period 1, but he may get a chance to enter a better paid contract in period 2 without having to breach an existing contract.

In this modified model, we will assume that the employee has no alternative offers at date 1: his choice is to sign the contract offered by employer 1 (with a duration of 2 periods) or to stay unemployed for one additional period. If the employee does not enter into the first contract in period 1, he has a chance $p$ to be offered a better contract $W_2$ for period 2 by a second employer who could not observe the employee’s productivity in period 1, but he may have figured out the potential productivity of the employee after having organized entrance exams. We will assume that if the employee worked in period 1, and the second employer could observe it to some extent ($s > 0$), that in that case the second employer will base his offer on that observation instead of organizing entrance exams. So if the employee enters the contract in period 1, $p = 0$ (unless $s = 0$).

If the second employer does not offer a better contract, the employee has the opportunity to work for the first employer at wage $W_1$ during the second period only and we will assume him to do so.

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8 For proposition 4, we use a sort of mixed model, where the employee has signed already the contract but nevertheless has a chance $p$ that later a better contract will be offered for period 2 by an employer who could not observe the employee’s productivity in period 1.
2.2. General assumptions throughout the paper

We assume rational and risk neutral actors. We also assume that renegotiation between the employee and employer 1 and between employer 1 and employer 2 is not possible. We assume an income maximizing employee, seeking to maximize his total net income of both periods (see Eq. 2.1).

2.3. Components of the model

We will denote the elements of the model by the following symbols:
- \( E \) = employee.
- \( R_1 \) = Employer 1, the employer with whom the original contract is signed.
- \( R_2 \) = Employer 2, the competing employer who offers an alternative contract after the first period.
- \( P_0 \) = productivity as expected by employer \( R_1 \) before entering into the first contract. At the same time the minimum productivity required by that employer (if the employee does not reach this productivity level, he will be dismissed immediately).
- \( P_0 \) may differ from \( P_1 \) (the true productivity in period 1) if the employee works harder than he strictly should. By working harder, the employee wants to signal to the market that he is able to work harder than the standard employee (not every employee may have the talents or the character to reach a higher productivity than \( P_0 \)).
- \( P_1 \) = true productivity of the employee in period 1. It cannot be lower than \( P_0 \).
- \( P_1^{*} \) = optimal productivity of the employee, taking effort costs into account. This is the productivity level the employee would reach if all effects of his work were perfectly internalized. Here the marginal productivity equals the marginal effort costs (\( P_1^{*} = e_1^{*} \)).
- \( P_1^{\max} \) = maximum productivity of the employee. The effort costs to reach this level may be excessive (\( P_1^{*} < e_1^{*} \)).
- \( W_1 \) = the employee’s wage in period 1 (and at the same time the wage in period 2 if the employee stays with the first employer).
- \( W_1 \) is fixed: it is independent of the employee’s productivity in that period (\( P_1 \)).
- \( W_2 \) = the alternative wage in period 2, offered by \( R_2 \).
- \( r \) = the initial rents. If the first employer receives no initial rents (\( r = 0 \)), then \( W_1 = P_0 \).
- If the employer receives initial rents, \( W_1 = P_0 - r \).
- \( s \) = the signaling factor, defined as \( (W_2 - W_1)/(P_1 - P_0) \). If we assume no rents, \( s = (W_2 - P_0)/(P_1 - P_0) \).

For the sake of simplicity, we assume \( s \) to be constant.
- \( e \) = effort level in period 1; in other words, how hard the employee works. This is the crucial independent variable in our model. \( e_0 \) and \( e^* \) denote the minimally required and the optimal productivity level respectively.
- \( e_1 \) = effort cost in period 1. This is the amount of disutility (expressed in monetary terms) the employee derives from working (i.e., from effort level \( e \)). The higher \( e_1 \) is, the more the employee dislikes working. When the employee likes working (job pleasure), \( e_1 \) is negative.
- \( e_0 \) = the effort cost necessary to reach the minimal productivity in period 1. If the employee dislikes working, \( e_0 \) is lower than \( e_1 \).
the effort cost in period 2. For the sake of simplicity, we assume e_2 to be the same whether the employee stays with the first employer or moves to the second employer. At first sight this may seem to be implausible, employees may have to work harder in a better paid job. But in this model we assume that in his new job the employee has to choose: either to work indeed as hard as promised or to be opportunistic and reduce the effort cost to e_0. If he stays with the first employer, he has the same choice: keeping the effort cost at e_0 or caring about his reputation on the labor market and working harder in order to get better offers in period 3. In this paper we will not analyze the game-theoretical aspects of the repeated games that may be played in the real labor market.

I_1 = the net income of the employee in period 1 (taking effort costs into account).

I_2 = the net income of the employee in period 2 (including effort costs e_2 and sanction for breach).

p = probability that a better-paid job will be offered for period 2 if the employee does not signal his higher than required productivity in the first period. In the simplest form of our model (used in sections 3 to 8) we will assume p to be zero.

c = court (error) factor. For the sake of simplicity, we assume c to be constant. If c = 1, there is no court error. The court perfectly observes how much the true productivity is above the minimally required (we will assume courts will perfectly observe W_1 anyway; in other words, we will assume away tax fraud and wages in kind, which may make it difficult for judges to find out the true wages).

If c < 1, this means that courts underestimate how much the true productivity is above the minimum productivity. This is a plausible assumption and will be explored in section 5.

c is relevant only for the ex post expectation measure. Under ex ante versions of the expectation measure (discussed in section 7) the sanction does not depend on the true productivity P_1 and therefore it is irrelevant how well courts observe P_1. If there are no rents, c can be defined as S/(P_1 - P_0). If there are rents, c = (S - r)/(P_1 - P_0).

If c > 1, courts will overreact to productivity increases and believe the employee is more productive than he really is; this is an implausible assumption and its consequences will not be analyzed in this paper.

S = sanction for breach of contract if the employee worked hard.

S_L = sanction for breach of contract if the employee worked at a minimal level (as will be further explained, this sanction will be lower under the ex post expectation measure).

2.4. Marginal variables

Since the effort level ε is the crucial independent variable, all marginal concepts are to be read in the effort level ε. For instance, P_1' = dP_1/dε.

In the same line, W_2', e_1', I_1', I_2', S' stand for respectively the marginal W_2, e_1, I_1, I_2, S (in terms of ε). Since P_0, e_0, e_2, r and W_1 are independent from ε, P_0', e_0', e_2', r' and W_1' are all equal to zero.
2.5. The effects of the employee’s effort level in period 1 (Fig. 1)

It may be helpful to clarify the model by a block diagram to illustrate the consequences of an increased effort level in period 1.

If his effort level $e$ goes up (i.e., the employee works harder) his productivity in the firm ($P_1$) increases, but so does his personal effort cost $e_1$. An increase of $e$ has no effect on his wage $W_1$ since his wage is fixed in period 1. The increased productivity $P_1$ is observed (but not perfectly since the factor $s$ may differ from 1) by a second employer and leads to a higher wage (offered by the latter) in the second period ($W_2$). But under the ex post expectation measure it will also lead to a higher sanction upon breach $S$. This sanction can be under- or overcompensatory if courts imperfectly observe the productivity (the factor $c$ may differ from one).\(^9\)

2.6. The employee’s net income under the 5 alternative choices

Fig. 2 gives an overview of the alternatives of the employee.

In the basic model (in which we assume that the employee already entered the two period contract with employer $R_1$ and in which we assume that $p = 0$) the employee has 4 alternatives: A, B, C and D.

In the modified model (used in section 8 only), the employee has also a 5th alternative: E.

The employee wants to maximize his income in both periods:

\begin{align}
\text{(2.1) } \max & (I_1 + I_2) \\
\text{If we assume that } p = 0, \text{ so that the wage offered by } R_2 \text{ depends solely on his observation of the employee’s productivity in period 1, the wage offered by the second employer is:}
\end{align}

\(^9\) To keep this block diagram simple we have made a few assumptions: $P_1' > 0$ (the marginal productivity is positive, i.e., working harder leads to a higher productivity), $e_1' > 0$ (working harder is unpleasant, i.e., leads to higher effort costs), $s = 0$ and $c = 0$. These assumptions are not always made in the rest of the paper.
(2.2) \( W_2 = P_0 + s \cdot (P_1 - P_0) \)
Under alternative A (he enters the contract, works hard, and breaches), his net income is:

(2.3) \( I_1 + I_2 = W_1 - e_1 + W_2 - e_2 - S \)
\[= (P_0 - r) - e_1 + P_0 + s \cdot (P_1 - P_0) - e_2 - S\]
\[= 2P_0 - r + s \cdot (P_1 - P_0) - e_1 - e_2 - S\]
Under alternative B (he enters the contract, works hard, and stays), his net income is:

(2.4) \( I_1 + I_2 = W_1 - e_1 + W_1 - e_2 \)
\[= 2P_0 - 2r - e_1 - e_2\]
Under alternative C (he enters the contract, works at a minimal level and breaches), his net income is:

(2.5) \( I_1 + I_2 = W_1 - e_0 + P_0 - e_2 - S_L \)
\[= (P_0 - r) + P_0 - e_0 - e_2 - S_L\]
\[= 2P_0 - r - e_0 - e_2 - S_L\]
Under alternative D (he enters the contract, works at a minimal level and stays), his net income is:

\[ (2.6) \quad I_1 + I_2 = W_1 - e_0 + W_1 - e_2 \]
\[ = 2P_0 - 2r - e_0 - e_2 \]

Under alternative E (he does not enter the contract in period one, but signs a better contract in period 2 if he gets one, or works for the first employer at the wage that was first offered), his net income is:

\[ (2.7) \quad I_1 + I_2 = 0 + p(W_2 - e_2) + (1-p)(W_1 - e_2) \]

2.7. Under what conditions will the employee work hard?

Under what conditions will the employee decide to work in period 1? In our comparison of the 4 alternatives (of the basic model), we can easily simplify the analysis by deleting alternative B, since an employee who dislikes working will always consider this alternative as inferior to alternative D.

The employee will work hard only if he prefers alternative A (working hard and breaching) to alternative D (working at a minimal level and staying) or C (working at a minimal level and breaching).

Comparing A and D we find the employee will work hard in period 1 only if the following holds:

\[ (2.8) \quad 2P_0 - r + s. (P_1 - P_0) - e_1 - e_2 - S > 2P_0 - 2r - e_0 - e_2 \]

or:

\[ (2.9) \quad s. (P_1 - P_0) + r - S > e_1 - e_0 \] (condition for the employee to work hard)

The employee should also prefer alternative A to alternative C if we want him to work hard:

\[ (2.10) \quad 2P_0 - r + s. (P_1 - P_0) - e_1 - e_2 - S > 2P_0 - r - e_0 - e_2 - S_L \]
\[ (2.11) \quad s. (P_1 - P_0) + S_L - S > e_1 - e_0 \]

Condition 2.11 is identical to condition 2.9 for the ex post expectation measure (where \( S_L = r \) since if an employee works at a minimal level the lost expected profits for the employer are the initial rents \( r \)) as well as for the ex ante minimally expected profits measure (where \( S_L = S = r \) since the sanction is the lost rent irrespective from how hard the employee worked).

2.8. Defining the ex post expectation measure

The expectation measure awards compensation for both reliance costs and expected profits. But for the sake of simplicity we assume away reliance costs and only consider damages for lost expected profits in this model.

The expectation measure can get several definitions, depending on how courts measure lost profits in practice. Under the normal definition, courts will try to measure the expected profits the promisee would have made by taking a look at the true past performance \( (P_1) \). We will call this the ex post expectation measure, because courts look here at what happened after the contract was signed (at the situation at the time of the breach). To put it simple, courts measure how much the employer lost by the employee’s leave by asking how good
he was, so they base their judgment on how good he is by looking at how good he was in the past period.

If courts perfectly apply the ex post expectation measure, it can be defined as:

\[ S = P_1 - W_1 = P_1 - (P_0 - r) = r + (P_1 - P_0) \]

If courts underestimate how much the true productivity \( P_1 \) is above \( P_0 \), the ex post expectation measure is in reality:

\[
(2.12) \quad S = r + c(P_1 - P_0) \quad \text{(ex post expectation measure)}
\]

If we bring this definition in the conditions for the employee to work hard (2.9), we find:

\[
(2.13) \quad s (P_1 - P_0) + r - r - c (P_1 - P_0) > e_1 - e_0
\]

or

\[
(2.14) \quad (s-c) (P_1 - P_0) > e_1 - e_0 \quad \text{(general condition for employee to work hard under ex post expectation measure)}
\]

2.9. Conditions for employee working optimally hard

In deciding how hard to work in period 1, efficiency requires perfect internalization. The advantage of working harder is a higher productivity. The disadvantage is a higher effort cost. The employee should work harder than minimally required if:

\[
(2.15) \quad P_1 - P_0 > e_1 - e_0 \quad \text{(working optimally hard)}
\]

Next, we have to express the first order condition for optimally hard working (taking into account that since \( P_0' = 0 \) and \( e_0' = 0 \)). The employee should spend additional levels of effort as long as:

\[
(2.16) \quad P_1' > e_1' \quad \text{(working optimally hard)}
\]

3. The effort level under the ex post expectation measure, assuming perfect compensation \((c = 1)\), productivity \( P_1 \) perfectly observed by the competing employer \((s = 1)\), no job pleasure \((e_1 > e_0)\)

To demonstrate how the ex post expectation measure influences the decision to work hard, we will start by making a number of simplifying assumptions. First we will assume that courts do not undercompensate. That is, courts are able to perfectly observe how much the true productivity \( P_1 \) was above the minimally required productivity \( P_0 \) \((c = 1)\). In addition we will assume that the information on the labor market is perfect. That is, the second (competing) employer perfectly observes the true productivity \( P_1 \) of the employee in period 1 \((s = 1)\). Finally, we will make the common assumption that employees dislike working \((e_1 > e_0)\).

Proposition 1: If the employee’s productivity in period 1 is perfectly observed on the market \((s=1)\), he will work optimally hard under a no damages rule, but he will work at a minimum level \((P_0)\) under the (perfectly applied) ex post expectation measure if he dislikes working.
This result can be easily shown.\textsuperscript{10} If we bring these assumptions in the general condition for the employee to work hard under ex post expectation measure of Eq. 2.14, we find that the employee will only work hard if:

\begin{equation}
(3.1) \quad (P_1 - P_0) - (P_1 - P_0) > e_1 - e_0 \text{ or } 0 > e_1 - e_0
\end{equation}

This condition can never be satisfied if employee dislikes working ($e_1 > e_0$).

What would happen if there were no sanction for breach? In that case we should refer to the comparison of alternative A to C, since in the absence of sanctions, the employee would always prefer C to D.

\begin{equation}
(2.11) \quad s(P_1 - P_0) + S_L - S > e_1 - e_0
\end{equation}

If we bring ($S = 0$) in Eq. (2.11), we find that he would work hard if:

\begin{equation}
(3.2) \quad s(P_1 - P_0) > e_1 - e_0
\end{equation}

If we keep the assumption $s = 1$, we find that he would work hard if:

\begin{equation}
(3.3) \quad P_1 - P_0 > e_1 - e_0
\end{equation}

This is the same equation as 2.15 which means that the outcome is efficient.

In other words, if wages are fixed in one period, but employees are perfectly rewarded for their extra productivity in terms of a higher wage in the following period, they will work optimally hard.

The ex post expectation measure completely removes this incentive. Actually, the (perfectly enforced) ex post expectation measure is the equivalent of a 100% taxation on the employee’s productivity.

The incentive problem arises because the fruits of the employee’s labor ($P_1 - P_0$) are completely removed by the legal sanction for breach. If the signaling factor $s < 1$, a perfectly enforced ex post expectation measure would really bring the productive employee in a hopeless situation. If he works hard in the first period he will be offered a higher wage in the second period but this surplus is completely set off by the higher sanction for breach. If he works at a minimal level, he will escape the sanction for breach but will not get a better job.

4. Relaxing assumptions: productivity imperfectly observed ($s \neq 1$)

Proposition 2: If the signaling factor is below 1 but above 0 ($0 < s < 1$) the incentives to work hard are still better under a no damages rule than under the ex post expectation measure.

For the no damages rule, we start from:

\begin{equation}
(3.2) \quad s(P_1 - P_0) > e_1 - e_0 \text{ (condition for employee working hard under no damages rule)}
\end{equation}

For the expectation measure we start from:

\begin{equation}
(2.14) \quad s(P_1 - P_0) - c(P_1 - P_0) > e_1 - e_0 \text{ (general condition for employee to work hard under ex post expectation measure)}
\end{equation}

For the expectation measure it will be less likely that the first term will be bigger than the second term (if we make the plausible assumption that $P_1 > P_0$, i.e., that hard working results in a higher output). From this follows that the incentives to work hard are better under

\textsuperscript{10} It’s easy to show that an analysis in marginal terms gives the same results.
the no damages rule. (Actually if $P_1 > P_0$ and $s < 1$, the marginal effort cost must still be negative if courts do not undercompensate ($c = 1$), that is, the employee must like working hard under the expectation measure. Under the no damages rule, it is possible that the employee does not like working but that this additional effort cost is smaller than the wage increase in the second period.)

**Proposition 3:** If markets overreact to the observed productivity ($s > 1$), the employee will work harder than optimal under a no damages rule. Under some conditions, the ex post expectation measure may correct this market failure.

This assumption of overreacting markets ($s > 1$) is rather unlikely, but not completely impossible. For instance, in soccer world championships, a player’s productivity during 2 or 3 weeks is taken as a measure for his expected productivity during the following 2 or 3 years (players that perform well at the championship are offered exceptionally favorable contracts). As a consequence, the players’ effort level during these 2 weeks is extreme. If we assume away the pleasure of spectators of the championship and other things and only consider this as an exposition of talent, one can argue that the players’ productivity will be overoptimal during that short period.

In these rather unlikely situations, the ex post expectation measure may correct the market. It is the equivalent of tax on the market’s overenthusiasm.

Again, we compare 3.2 and 2.14:

(3.2) $s (P_1 - P_0) > e_1 - e_0$ (conditions employee working hard under no damages rule if no initial rents for $R_1$)

For the expectation measure we start from:

(2.14) $s (P_1 - P_0) - c (P_1 - P_0) > e_1 - e_0$ (general condition for employee to work hard under ex post expectation measure)

Assume for the sake of simplicity that courts do not undercompensate ($c = 1$), we find:

(4.1) $(s - 1) (P_1 - P_0) > e_1 - e_0$ (general condition for employee to work hard under ex post expectation measure)

In marginal terms, the employee will work harder than he should under the perfectly enforced expectation measure if:

(4.2) $(s - 1) P_1' > e_1' > P_1'$ (working too hard under perfectly enforced ex post expectation measure)

Condition 4.2 for working too hard is possible only if $s > 2$. If $s = 2$, the employee will work optimally hard. If $s < 2$, the employee will work less hard than optimal. But if $s > 2$ and we compare 3.2 and 4.1, we see that the ex post expectation measure brings the left term closer to the optimal situation (as defined in 2.15).

So if $s > 2$, the expectation measure will be superior. If $2 > s > 1$, one cannot determine a priori what is the best rule: the no damages rule makes the employee work too hard, the perfectly defined ex post expectation measure makes him work too little. What is the best rule then depends on the distribution of effort levels and productivity levels.

Nevertheless we should repeat that the conditions analyzed under this proposition (a signaling factor $s > 1$) are rather implausible.
**Proposition 4:** Even if the employee’s productivity in period 1 is not observed on the market \((s=0)\), the ex post expectation measure can still undermine the incentive to work hard if there is a chance \((p > 0)\) that a competing employer will make a better offer in period 2.

If \(s = 0\) the employee who dislikes working will not work above the minimal level under both the ex post expectation measure and the no damages rule.

To show this result, we have to start from 3.2 and 2.14

\[
(3.2) \quad s \cdot (P_1 - P_0) > e_1 - e_0 \quad \text{(conditions employee working hard under no damages rule if no initial rents for } R_1) \\
(2.14) \quad (s-c) \cdot (P_1 - P_0) > e_1 - e_0 \quad \text{(general condition for employee to work hard under ex post expectation measure)}
\]

If \(s = 0\), the left term becomes zero in 3.2 or negative in 2.14. This means that both conditions can only be fulfilled if the right term is in any case negative, which means that the employee likes working \((e_1 < e_0)\). At first sight the situation is worse under the expectation measure than under the no damages rule. Under the expectation measure it is required (in marginal terms) that the marginal effort cost plus the productivity increase are negative. So under the expectation measure there are two reasons for not working hard if signaling your productivity is impossible on the market. The first reason is that you do not like to work hard, the second is that you will have to pay more when you breach the contract. Under the no damages rule the second reason is absent. You will work hard if you like working hard and you won’t it you don’t like working hard.

However one should not forget that the expectation measure is a conditional sanction: only in case of breach it has to be paid. If the second employer can’t observe the employee’s productivity \((s = 0)\), then the employee will not be interested in breaching the first contract since the offered wage is exactly the same as the first one (unless there are rents, but these are taxed away by the expectation measure). In that case the incentives to work hard are exactly the same under the perfectly enforced ex post expectation measure and the no damages rule: employees will work hard only to the extent that they like working hard.

However, the expectation measure makes it worse if there is a chance that the employee will get a better offer from an employer who could not observe the productivity in period 1 but who for instance organized exams (in other words if \(p > 0\)).

5. **Relaxing assumptions: undercompensation by courts \((c < 1)\)**

If courts underestimate the true losses \((c < 1)\), especially because they underestimate the true productivity \(P_1\), we will use the term **undercompensatory ex post expectation measure.**\(^{11}\)

\(^{11}\) A special example of an undercompensatory ex post expectation measure is an *ex ante* expectation measure where nevertheless courts only partially take into account the ex post productivity as one of the elements of evidence of the *ex ante* expected productivity.
**Proposition 5:** an undercompensatory \((c < 1)\) ex post expectation measure is also inferior to a no damages rule unless the signaling factor is high.

This follows directly from a comparison of 2.15, 3.2 and 2.14:

1. \((2.15)\) \(P_1 - P_0 > e_1 - e_0\) (condition for working optimally hard)
2. \((3.2)\) \(s \cdot (P_1 - P_0) > e_1 - e_0\) (condition for employee willing to work hard under no damages rule)
3. \((2.14)\) \((s - c) (P_1 - P_0) > e_1 - e_0\) (condition for employee willing to work hard under ex post expectation measure)

If the signaling factor \(s \leq 1\), the ex post expectation measure undermines the employee’s incentives even if it is extremely undercompensatory (e.g., \(c = 0.1\)). If markets overreact to signals \((s > 1)\) we have to refer to the discussion of the previous propositions. Under some (unlikely) conditions, an undercompensatory ex post expectation measure can give the best outcome (when the perfectly compensatory is a bit too high a tax on the market’s over-enthusiasm). This can only be the case as long as \(1 < s < 2\), since if \(s\) becomes higher than 2, the perfectly compensatory measure disciplines the market better (because harder).

**6. Relaxed assumptions: job satisfaction \((e_1 < e_0)\)**

Proposition 1 stated that a perfectly applied \((c = 1)\) ex post expectation measure in a market where productivity of other employees is perfectly observed \((s = 1)\) completely discourages the employee to work hard: he will work at a minimum level \((P_0)\) if he dislikes working. At first sight this seems to suggest that the ex post expectation measure does no harm if people like working.

Assuming that some people like to work is of course not completely unrealistic. Most professors, sportsmen and artists like to work. Should the ex post expectation measure be kept in force in these sectors of the labor market?

**Proposition 6:** Even if the employee’s likes working \((e_1 < e_0)\) though not infinitely (there is a point where \(e_1 > 0\)), the ex post expectation measure undermines the incentives to work hard.

Even if some people like to work hard, there is always a point beyond which working harder becomes unpleasant \((e_1'\) is not positive for all \(e_1)\). In that case condition 3.1 is no longer satisfied. This is a plausible assumption. Even if you love working 70 hours a week, you may not increase your job satisfaction by working 80 hours a week. In our model, there is a financial reward on the market in that the wage in the next period will increase. However, the legal sanction upon breach fully taxes this reward away.

So if the expectation measure does not completely demotive people who like working hard, it makes even this category work less hard. The no damages rule is superior in that respect.

This can be shown as follows:

If we rewrite 3.2 in marginal terms, we find that under the no damages rule, he will work hard if:

\[
(3.2) \quad s \cdot P_1' > e_1'
\]
If we rewrite 2.14 in marginal terms, we find that under the ex post expectation measure rule, he will work hard if:

\[(s-c) \cdot P_1 > e_1' \]

The last condition is more difficult to be fulfilled.

7. The effort level under alternative expectation measures

Under the ex post expectation measure, the expected profit is measured on the basis of the effective productivity \( P_1 \), observed ex post. Theoretically, judges could instead take the \( \text{ex ante} \) minimally expected productivity \( P_0 \) into account. Of course, in the real world, such a measure would face serious evidence problems. But we will assume these evidence problems aside and will analyze how this rule changes the incentives to work hard.

For the \( \text{ex ante} \) minimally expected profits measure, the sanction can be denoted as follows.

\[
S = P_0 - W_1 = r \quad (\text{ex ante expected profits measure})
\]

\[
S' = 0
\]

This sanction is independent from how hard the employee works \( (P_1) \). His performance ex post is irrelevant, what counts is the \( \text{ex ante} \) expected productivity \( (P_0) \). Therefore \( S = S_L \).

It is important to notice that under his measure there is only a sanction in case of initial rents for the first employer \( (r > 0) \). Indeed, if there are no rents, then \( P_0 = W_1 \) and the \( S = 0 \).

Theoretically, the expectation measure could also be defined in terms of potential productivity. For instance, an average first division football player may not fully use his talents. When he leaves, the club could say: “If you would have wanted, you could have been the new Cruyff. So pay the same damages as Cruyff would have had to.”

Once again, in the real world, such a measure could face serious evidence problems. Potential productivity may not be verifiable: it is quite plausible to assume that in reality judges do not know the employee’s potential productivity, if he never showed it. Nevertheless we will examine its properties with regard to the incentives to work hard. A distinction can be made between \( \text{maximal productivity} \) and \( \text{optimal productivity} \), the latter taking the effort costs into account. For instance, an athlete may have the talents to become a world champion if he is willing to suffer every day. But since he is not willing to pay that personal price, the optimal situation may be that he is merely a good local athlete.

For the \( \text{maximal productivity based expectation measure} \), the sanction can be denoted as follows.

\[
S = P_{\text{max}} - W_1 = P_{\text{max}} - P_0 + r \quad (\text{maximal productivity based expectation measure})
\]

\[
S' = 0
\]

For the \( \text{optimal productivity based expectation measure} \), the sanction can be denoted as follows.

\[
S = P_{1*} - W_1 = P_{1*} - P_0 + r \quad (\text{optimal productivity based expectation measure})
\]

\[
S' = 0
\]

A special feature here is that \( P_{1*} = e_1' \): the productivity is optimal if it is at the point where the marginal productivity equals the marginal effort cost.

While the ex post defined expectation measure can be considered as a 100% taxation on
the employee’s productivity, all mentioned alternative expectation measures can be seen as a lump-sum tax (since \( S > 0 \) and \( S' = 0 \)). They are also conditional taxes: they have to be paid to the employer only in case of breach.

Yet these 3 variants have different properties as to the their effect on the incentives to work hard.

**Proposition 7:** The ex ante minimally expected profits measure does not change the incentives to work hard (compared to the no damages rule) if the second employer has no rents.

As already remarked, there will only be a sanction (different from 0) if there are initial rents for the first employer (\( P_0 > W_1 \)). In our model, we assumed that the second employer will offer a wage that is no lower than \( P_0 \): \( W_2 = P_0 + s (P_1 - P_0) \)

If we substitute \( S \) for \( r \) in the general condition for the employee to work hard of 2.9, we find:

\[
(7.7) \quad s (P_1 - P_0) + r - r > e_1 - e_0 \quad \text{(condition for the employee to work hard)}
\]

\[
(7.8) \quad s (P_1 - P_0) > e_1 - e_0
\]

This is exactly the same condition as under a no damages rule

Comment: the *ex ante* expectation measure is to be seen as a lump-sum tax which equals \( r \). If the employee breaches, he has to pay the rent the first employer would have made. But if the wage offered by the competing employer starts at \( P_0 \) (even if the employee performed at \( P_0 \)), then this new wage will make it possible to compensate the first employer anyhow. Given the fact that working harder leads to an even higher wage, the employee keeps an incentive to work hard in the first period.

Of course, if we change the model and assume the second employer will also have a rent, be it a smaller one, than we find that the *ex ante* expectation measure will discourage some employees to work hard, just like other lump-sum taxes.

**Proposition 8:** Under the expectation measure defined in terms of potential (maximal) productivity, the incentive to work hard is seriously undermined (unless the signaling factor is implausibly high): employees will work harder than minimally only to the extent that they like working.

We repeat that this sanction is to be defined as follows:

\[
(7.3) \quad S = P_{\max} - W_1 = P_{\max} - P_0 + r \quad \text{(maximal productivity based expectation measure)}
\]

Even in the absence of rents (\( P_0 = W_1 \)), \( S \) can be higher than 0.

If we substitute \( S \) for \( P_{\max} - P_0 + r \) in the general condition for the employee to work hard, we find:

\[
(7.9) \quad s (P_1 - P_0) + P_{\max} + P_0 + r - r > e_1 - e_0 \quad \text{(condition for the employee to work hard)}
\]

\[
(7.10) \quad s (P_1 - P_0) > e_1 - e_0 + (P_{\max} - P_0)
\]

We have to compare this result to the one for the no damages rule of 3.2

\[
(3.2) \quad s (P_1 - P_0) > e_1 - e_0 \quad \text{(condition for the employee to work hard)}
\]

We see that it is much more difficult to satisfy condition 7.10 than 3.2. The employee will work hard only if:

- the signaling factor \( s \) is substantially higher than 1. In that case working hard becomes more likely the more \( P_1 \) gets closer to \( P_{\max} \).
the employee likes working \((e_0 > e_1)\). But even employees who like working will work less hard under the maximum productivity based expectation measure, because they are demotivated by the term \((P_{\text{max}} - P_0)\).

If the signaling factor \(s \leq 1\) (the most plausible situation), employees will not work above the minimum level unless they really like working.

Comment: this variant of the expectation measure is the equivalent of an extremely high lump-sum tax: the maximum productivity is taxed away. You will only work hard if you have a chance to get overpaid by the market (in our model: \(s > 1\)) or if you like working.

In marginal terms, however, expression 3.2 becomes

\[(7.11) \quad s P_1' > e_1'\]

which corresponds to the situation under the no damages rule. This means that once you have taken the decision to breach, your incentives to work hard are not affected anymore by the sanction. This is a typical feature of lump-sum taxes.

**Proposition 9:** Under the expectation measure defined in terms of optimal (taken effort costs into account) productivity, the incentive to work hard is seriously undermined (unless the signaling factor is implausibly high): employees will work harder than minimally only to the extent that they like working.

Here the sanction was defined as follows:

\[(7.5) \quad S = P_1^* - W_1 = P_1^* - P_0 + r \quad \text{(optimal productivity based expectation measure)}\]

Rents are not necessary to have a sanction: even if \(P_0 = W_1\), \(S\) can be higher than 0.

If we substitute \(S\) for \(P_{\text{max}} - P_0 + r\) in the general condition for the employee to work hard \((2.9)\), we find:

\[(7.12) \quad s (P_1 - P_0) - P^* + P_0 + r - r > e_1 - e_0 \quad \text{(condition for the employee to work hard)}\]

\[(7.13) \quad s (P_1 - P_0) > e_1 - e_0 + (P^* - P_0)\]

We have to compare this result to the one for the no damages rule of 3.2:

\[(3.2) \quad s (P_1 - P_0) > e_1 - e_0\]

We see that it is much more difficult to satisfy condition 7.13 than 3.2 because of term \((P^* - P_0)\). The employee will work hard only if:

- the signaling factor \(s\) is substantially higher than 1. In that case working hard becomes more likely the more \(P_1\) gets closer to \(P^*\). This will happen sooner than under the maximum productivity based expectation measure, since \(P_{\text{max}} > P^*\).
- the employee likes working \((e_0 > e_1)\). But even employees who like working will work less hard under the maximum productivity based expectation measure, because they are demotivated by the term \((P^* - P_0)\). (Again the result is not so bad as under the maximum productivity based expectation measure, since \(P_{\text{max}} > P^*\)).

Comment: this variant is the equivalent of a very high lump-sum tax on working hard, but a tax that is still a little lower than the maximum productivity based expectation measure.
8. The employee’s decision to enter into the first contract and the second employer’s decision to offer a better contract

In this section we will focus on the employee’s decision to enter into the first contract and the competing employer’s decision to offer a better contract.

For proposition 10 we start earlier in the decision tree and go back to date 1 when the employee decides whether or not to sign the contract offered by R1.

Proposition 10: the ex post expectation measure may create unemployment in that it inefficiently deters employees entering into labor contracts.

We have already shown in section 3 that the ex post expectation measure can make the employee choose alternative D (working at a minimal level in period 1 and staying in period 2) instead of working hard. Under some conditions, rational employees may therefore decide not to enter the contract in period 1.

To show the result of proposition 10, it suffices to compare alternatives A and E. In section 2, we have seen that under alternative D (he enters the contract, works at a minimal level and stays), his net income is:

\[ I_1 + I_2 = W_1 - e_0 + W_1 - e_2 \]
\[ = 2p_0 - 2r - e_0 - e_2 \]

Under alternative E (he does not enter the contract in period one, but signs a better contract in period 2 if he gets one, or works for the first employer at the wage that was first offered), his net income is:

\[ I_1 + I_2 = 0 + p (W_2 - e_2) + (1-p) (W_1 - e_2) \]

The employee will prefer alternative E above alternative D if:

\[ p (W_2 - e_2) + (1-p) (W_1 - e_2) > W_1 - e_0 + W_1 - e_2 \]

This choice (the choice not to work in period 1) is Pareto inefficient if the wage he could receive is higher than the effort cost:

\[ W_1 - e_0 > 0 \]

In the absence of a sanction for breach, the employee would of course always choose to work in the first period if condition 6.3 is fulfilled: that is, he would work in those cases where employment is efficient.12

So inefficient unemployment is created by the ex post expectation measure if the following conditions are fulfilled:

\[ p (W_2 - W_1) > W_1 - e_0 > 0 \]

It is sufficient to show a plausible numerical example in which these conditions are fulfilled: take for instance \( e_0 = 1, W_1 = 2, W_2 = 4 \) and \( p > 0.5 \).

The unemployment is more likely to occur when the wage offered for period 1 (\( W_1 \)) is not

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12 Strictly speaking: condition 6.3 should be rewritten as \( p_0 - e_0 > 0 \). If the employer earns rents and thus underpays, this may make some intramarginal employees to stop working. But this is a problem that is not created by the introduction of sanctions for breach. For the sake of simplicity we neglect this aspect in our comparative analysis of ex post expectation measure versus the no damages rule.
much higher than the effort cost required in period 1 (\(e_0\)), when that wage \(W_1\) is much lower than what the employee hopes to get in period 2 (\(W_2\)) and when the chances of such a better offer (\(p\)) are relatively high.

**Proposition 11:** The ex post expectation measure may prevent workers to move to the jobs where they are most productive (i.e., hinder efficient breach) in that it undermines the employees’ incentives to signal on the market how productive they can be so that competing employers may not have the information to make better proposals anymore. In that respect the expectation measure destroys the information necessary for efficient breaching.

The fact that the ex post expectation measure undermines the employee’s incentives to signal on the market how productive the employee can be, has been demonstrated already in propositions 1, 2 and 5.

Proposition 11 is in contradiction with the current analysis in the economic analysis of general contract law. It is generally believed that a perfectly enforced expectation measure leads to efficient breaching. Of course this analysis is based on a few assumptions, and one is that the information necessary to consider efficient breaching is available. With respect to third party offers, the standard analysis starts at the point when the third party has already made an offer.

But the fact that the expectation measure itself destroys the information necessary for such offers, is a feature that was overlooked in the literature, as far as we know.

### 9. General Conclusions

Under American or Dutch law, employees who leave the firm earlier than expected do not have to compensate the employer for lost profits in most cases. This conflicts with the general view in law and economics scholarship that the expectation measure is the superior remedy. Until now, law and economics models on remedies for contract breach focused on the decision to breach or to perform, on the decision whether or not to enter into the contract, on the decision whether or not to reopen the negotiations after a contract has been signed, and on the incentives for optimal reliance and precaution. But it did not consider the incentives to work hard. That is because in normal contracts (like the construction contract, a popular example in classes) the level of effort of the seller/producer is precisely defined. However, in most labor contracts this is not the case.

In this paper we have compared several variants of the expectation measure with the rule of no damages for breach of contract (since we will assume away reliance measure, the superiority of the no damages rule can also be seen as the superiority of the reliance measure over the expectation measure: both the reliance measure and the no damages rule do not award compensation for lost profits, which is exactly what is modeled here).

In general the analysis has shown that the expectation measure seriously undermines the employee’s incentive to work hard. Our conclusion holds even if the first employer earned rents, or if the employee likes to work, or if courts undercompensate. The ex post expectation
measure improves the employee’s incentives only if markets seriously overreact to productivity signals.

We also have analyzed the incentive properties of 3 alternative expectation measures. The \textit{ex ante} minimally expected profits measure does not change the incentives to work hard, but if the expectation measure is defined in terms of potential (maximal) or optimal productivity, the incentive to work hard is seriously undermined. We also show that the ex post expectation measure may create unemployment in that it inefficiently deters employees from entering into labor contracts.

Contrary to the current view in law and economics scholarship we have showed that the expectation measure can be a barrier to efficient breaching. It destroys the information necessary for efficient breach by undermining the employees’ incentives to signal on the market how productive they can be. As a consequence, competing employers no longer get the information they need to make better proposals.

Of course our model has its limitations. We left aside end game problems: we focused on incentive problems in period 1 assuming that there was a second period to come. In addition, our model started from fixed wage contracts. These contracts have indeed inherent incentive problems. If the employee’s wage in period 1 is directly related to his productivity in that period, the analysis may change. Nevertheless, we believe that the contract type we have modeled is quite common on the labor market. Professors, sportsmen and many other employees have a wage that is fixed in the short run. They work hard in order to be offered a better wage in the future.

This paper gives additional support to the viewpoint that labor contracts should have rules that differ from general contract law.