The Effect of Time on Default Remedies for Breach of Contract *

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Abstract
Among default remedies for breach of contract, expectation damages are believed superior to property rules such as specific performance since they allow the promisor to breach inefficient contracts when renegotiation is economically infeasible. We examine whether the promisor's ability to accurately determine when to breach is maintained when taking into account the value of time that distinguishes between immediate performance and paying damages in court. We show that if prejudgment interest does not equal the promisor's subjective value from time (e.g., if the court uses the promisee's interest rate to fully compensate him), the promisor's breach decision will be distorted. When renegotiation is feasible this problem of excessive breach is mitigated, however asymmetric information about discount factors can lead to a renegotiation process that is doomed to fail. Punitive damages behave similarly. Specific performance without ancillary monetary awards always creates a pie for division between the parties. Ancillary awards for delay are unlikely to change this, but ancillary awards for partial breach make specific performance behave more like expectation damages, although to a lesser degree.

JEL Classification: K12
Keywords: contract law, breach of contract, default remedies, expectation damages, specific performance, punitive damages, renegotiation costs, discount factor, prejudgment interest.
"Now Aesop was not much of a finance major, because he said something like 'A bird in the hand is worth two in the bush'. But he doesn't say when. Interest rates – the cost of borrowing – are the price of 'when'. They are to finance as gravity is to physics. As interest rates vary, the value of all financial assets – houses, stocks, bonds – changes, as if the price of birds had fluctuated. And that's why sometimes a bird in the hand is better than two birds in the bush and sometimes two in the bush are better than one in the hand." (Attributed to Warren Buffett, Sun Valley, Idaho, July 1999 in Alice Schroeder, The Snowball: Warren Buffett and the Business of Life, p. 16.)

1. Introduction

The standard analysis of remedies for breach of contract shows that their importance grows with the cost of renegotiation. Consider a situation in which circumstances change and a party to a contract finds himself in a situation in which he loses from carrying out the contract, and thus prefers to breach. If it is possible for the party to costlessly renegotiate with his contractual partner, the parties can resolve the dispute by agreement, and continue to carry out efficient contracts and terminate inefficient ones. This is believed true independent of the default remedy (Hermalin, Katz and Craswell, 2007 pp. 99), which may affect the division of surplus that results from the renegotiation process, but not the outcome of the process.

In general, however, renegotiation is not costless, but may, in fact, be quite costly. To understand why, assume that the loss contract is inefficient. If the parties attempt to renegotiate termination of the contract, there is no guarantee that the renegotiation will be successful. Successful renegotiation yields a "pie" (relative to court proceedings) that can be divided between the parties, but theory does not tell us how they will divide the pie.1 There are multiple equilibria in a renegotiation process, and this can, at least potentially, make renegotiation problematic. If the parties are stubborn, renegotiations to terminate the inefficient contract may fail (Polinsky, 1980, pp.1092)2 and, in that case, the sides may end up in court.3

If renegotiation is likely to fail, the choice of default remedy can be consequential. Scholars have suggested that in order to attain the goal of allocating the property to the highest valued consumer at the lowest cost, it is best to use a liability rule (à la

1 If there is a clear protocol governing the renegotiation process and this is known to both parties, then theory predicts a single equilibrium. Thus, for instance, if the promisor gets to make a take-it-or-leave-it offer, the result is an ultimatum game, with the promisor receiving the entire surplus. In general, however, such a protocol does not exist, and renegotiation processes are not well structured enough to yield a predictable outcome.

2 For more on this, see Ayres and Talley (1995, p. 1029-30). For a general discussion, see Cooter and Ulen (2008, p. 93-4, 264-5).

3 Polinsky (1980, p. 1092 and fn. 37) himself does not ascribe to this. He believes that strategic behavior will at most cause a delay in reaching an agreement. In the next Section we explain that from a game-theoretic perspective such a delay will only occur in the presence of uncertainty.
Calabresi and Melamed, 1972) such as expectation damages, that awards the promisee his loss from the breach, and thereby encourages the promisor to breach when his value from the breach is greater than the promisee's loss. If expectation damages can be well specified by the courts, this will replicate the renegotiation outcome (Shavell, 1980, 1984). This benefit from using expectation damages led many to conclude that this remedy always give precise incentives for breach of contracts. It leads to a Pareto optimal solution without the sides ever having to speak.

Other scholars, conversely, used Calabresi and Melamed's methodology to reach the opposite conclusion from those who promoted expectation damages. They claim that there is no reason to suspect that the parties would have difficulty in reaching agreement to terminate an inefficient contract through renegotiation, and, in fact, this path may be far less expensive than going through court (Farber, 1980, pp. 1450-1455, Friedman, 1989, pp. 6-7, Dodge, 1999, pp. 634, 670-672). The sides to the dispute are well acquainted with each other and there are few participants, both parameters that should lead to an efficient and speedy resolution (Ulen, 1984, pp. 369-370). Thus, it is better to use a property rule such as specific performance, under which the promisor is required by court order to fulfill the contract if he breaches. Under such a rule the promisor's dominant strategy will be not to breach unilaterally, but rather to buy his way out of the contract by offering the innocent party a payment for surrendering his right.

Although using the Calabresi and Melamed methodology did not lead to concurrence regarding which default remedy is preferable, it is nevertheless agreed that under the expectation damages regime, the promisor can breach if renegotiation is not economically feasible, and to settle out of court if it is. For this reason, it would seem that if the feasibility of renegotiation depends on the circumstances of the case, the model of efficient breach is preferable to a property rule since it is more flexible.

4 Also, remedies that protect a value lower than expectation damages, such as reliance damages (which give the innocent party any additional expenditure spent in order to maximize his welfare or his profit from the contract) and restitution of the contractual price are liability rules. As Shavell (1984) points out, these remedies give the promisor an incentive to breach excessively, and are thus inferior to expectation damages.

5 Of course, it requires the promisor to know what damages will be ruled in court. In the absence of this he may have to renegotiate with the promisee to terminate the contract for an agreed upon payment, which returns us to the bilateral monopoly problem.

6 Such is the case also for punitive damages in which the promisor must pay the promisee some multiple ($\alpha>1$) of his loss, and disgorgement in which the promisor transfer to the promisee any profit he realized from the breach. In all these cases the overcompensation the promisor is forced to pay to the promisee in court will generally 'swallow' the benefit from the breach. Therefore he will not dare breach, but will rather either complete the contract or renegotiation with the promisee for release.
allowing for both solutions; the promisor may unilaterally breach the contract (if he believes the renegotiation costs will be great or will fail) and go to court, or renegotiate a settlement.

In this paper we bring the purported flexibility and superiority of expectation damages into question. Two conclusions from efficient breach theory are that the promisor has a precise incentive whether to breach and that the parties to the dispute will choose correctly whether to renegotiate or go to court. These conclusions, however, disregard a key variable that must be considered when comparing such regimes – the value of time. Including this element in the analysis causes many of the accepted understandings to fall by the wayside.

The reason time needs to be taken into account when considering breach is immediate. It is clear that one of the major differences between breach and performance is the amount of time involved – breach allows the promisor the flexibility to push off payment of damages for the entire period of the court proceedings, which can be quite prolonged. Thus, the choice made by the promisor determines not only the size of the expenditure, but also when the expenditure is incurred. The choice, then, of immediate performance or breach depends on which is greater – the immediate cost of fulfilling the contractual obligation or the present value of the future payment from court proceedings, where the present value is calculated using the promisor's subjective discount factor. And yet, while pretty much any economic model with temporal implications will include discounting in the basic setup, this factor has been completely missing from the discussion of efficient breach theory.

While at first glance time costs would seem to be no different than other costs created by the litigation process, the implications are quite different. Note that while

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7 A discount factor is the number by which a future cash flow must be multiplied in order to obtain the value today. For example, someone who is willing to push off payment of a fine of 100 to a known future point as long as the payment at that point, including interest and penalties, will not be greater than 150 is said to be indifferent between a payment of 100 today and a payment of 150 at that future point. His discount factor over this period is 2/3 (150/100). There are many reasons that people might prefer pushing off payment to a later date rather than pay immediately. Immediate payment may require the person to take out a loan on which he will have to pay interest, and in some circumstances he may not have access to the credit market, as discussed below in Section 2.1. Alternatively, the party may have to pay using funds which would otherwise accrue interest. In addition, the party may foresee an improvement in his economic circumstances, thus making payment in the future more attractive. A discount factor is said to be subjective if it depends on personal factors that affect the value of time to the party under consideration, but do not necessarily affect other parties in the same manner.

8 Note that there is also an effect of time in other legal settings, such as in accident law and externalities.
the effects of time are caused by the litigation process, they are not actually costs paid by the parties; rather, they reflect the value of the payments at different points in time. As a result, while litigation costs can only decrease the payment each party receives, the effect of time can increase or decrease the payment (for instance, it tends to work in favor of the promisor, and is therefore comparable to a “negative” litigation cost).

The length of the court proceedings changes the implications from breach in two manners: it has a distributional effect on the promisee, and it affects the efficiency of the choice made by the promisor.

Consider first the promisee, who is entitled to compensation for his loss from the breach. In general, if the award is set equal to the loss caused by the breach, the promisor will have proper incentives to breach; he will breach when and only when he is left with a profit after compensating the promisee. However, if the promisee is not compensated at the time when the breach occurs, he is liable to suffer. What is necessary to fully compensate the promisee, is for the court to accurately measure the promisee's subjective discount factor, and use this to calculate the size of the award.

Consider the following example. Say a promisor agrees to sell a good to a promisee, and the value to the promisee is 1 million dollars. After the contract has been signed, but before the good is delivered, a third party arrives and offers 1.2 million dollars for the good. In such a case, efficiency is clearly served by either breaching the contract or terminating it, and paying expectation damages of 1 million dollars to the promisee. These damages will put the promisee in the position in which he would have been had the contract been fulfilled. However, let us assume that court proceedings take 5 years, and that the promisee's subjective discount factor is such that 1 million dollars today is equivalent, from his perspective, to 1.4 million dollars in 5 years. In this case, the promisee will be harmed unless the court awards him compensation of 1.4 million dollars. However, contract law has, for more than a century, measured compensation using objective criterion only (Muris, 1982 pp. 9)

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9 Note that there is another time cost which harms promisees as a class. Given the passage of time, there is a positive probability that the promisor will become insolvent prior to completion of the court proceedings, in which case the promisee will not be compensated at all, or only partially. This is another reason, in additional to the many others discussed in the literature, that explain some of the shortcomings of an expectation damages regime. For more on this issue, see Schwartz (1979, pp. 276-277), Farber (1980, p. 1450), Muris (1982), Sebert (1986, pp. 1571-1591), Warkol (1998, pp. 348-351) and Dodge (1999, p. 664).

10 We thank the referee for suggesting this example.
Thus, the court uses market values (and not private values) to measure damages, and any prejudgment interest awarded, if at all, is awarded using market interest rates (see the discussion in Section 2.1 below). This has distributional implications; if the promisee's subjective discount rate is greater than the court measured prejudgment interest rate, he will be undercompensated.

Note, however, that this does not affect the efficiency issue. Efficiency is measured at the time of the breach when the promisor is faced with the option to perform or breach. Returning to the example above, at the time of the breach the promisor could fully compensate the promisee for his loss and retain a profit. Thus, the breach in this case is efficient, and any distributional effects caused by the delay in compensation are secondary effects that lead the promisee to be undercompensated if court uses objective formulas in order to measure damages.

The second effect of time mentioned above, then, is on the efficiency of the choice made by the promisor. To guarantee that the promisor makes the efficient decision, the court will have to measure the promisor's subjective discount factor and set prejudgment interest equal to his discount rate. As we will show, the time costs affect the first-order decisions of whether to breach and whether to settle the dispute in court or through renegotiation, so that the opportunity the system offers the promisor to push off payment may disrupt the promisor's choices.

Beginning with a situation in which renegotiation is not economically feasible, when the promisor must decide alone whether to breach, consider what is necessary for expectation damages to yield economic efficiency. Efficiency requires breach

11 Muris (1982, pp. 1053-4) demonstrates that since Judge Holmes objectivism has dominated in Contract Law theory. As he states “In the field of contract remedies, objectivism often appears to dominate. Courts, having access to information about market prices, often value damages by an objective standard.” The first reason for this, according to Muris (1982, p. 1055), is that “although the use of market-based damages has an objective cast, it protects subjective value in a wide variety of cases.”

12 For a numerical example of undercompensation due to insufficient interest payments, see Warkol (1998, p. 350).

13 Note that undercompensation can stem from various sources, among them a subjective value the promisee has that cannot be measured by court (when there is no good substitute in the market), the cost of finding a substitute, court costs and prejudgment interest. Only some of these are related to the issue of efficiency. Efficiency requires that the promisor breaches only when he can profit after putting the promisee in as good a position as he would have been in had the contract been performed. Therefore, efficiency requires that the award must be sufficient to make the promisee whole at the time of the breach, but does not require that the award cover damages that arise only because of the fact that the breaching party can push off payment to a later period. Thus, efficiency requires that the award include the promisee's subjective value and the cost of finding a substitute, but the efficiency of the breacher's decision will not be distorted even if the court does not compensate for court costs and prejudgment interest.
when and only when the cost of fulfilling the contract exceeds the value from its fulfillment, *when both are measured at the time of breach*. The promisor, however, will pay the damages only after court proceedings have been exhausted. To guarantee that breach will occur when and only when the contract is inefficient, the present value of the court determined award must precisely equal the value of performance to the promisee – if the former is greater than the latter there will be too little breach, and if the converse, there will be too much breach.¹⁴

Given that court proceedings are lengthy, attainment of this equality requires that the court be able to 1) precisely determine the value of the contract to the promisee, and 2) precisely determine the *promisor's* subjective discount rate and make the prejudgment interest rate equal to this discount rate.¹⁵ The court must then use both of these to calculate the nominal payment that must be made at the conclusion of the court proceedings. The difficulties that arise with respect to the first of these have been discussed at length in the literature.¹⁶ This, however, is not subject of this paper, and we assume throughout that the court can precisely estimate this value and is willing to award this value in court. As we shall show, however, the second problem is also acute. We will explain why the court cannot always precisely determine the promisor's subjective discount factor, and why, even when they can, they are unlikely to use this measure in awarding prejudgment interest. If prejudgment interest determined by courts does not, for either reason, equal the promisor's subjective discount factor, default remedies that award monetary compensation, such as expectation damages, do not give the promisor a precise incentive to breach when and only when it is efficient to do so.

Turning to a situation in which renegotiation *is* economically feasible (and even in the extreme case when it is costless), then when the promisor has a credible threat to breach the contract, the determinant of whether renegotiation will succeed in yielding an efficient breach decision is no longer dependent on the level of prejudgment interest, but rather it is dependent on the *relative* discount factors of the parties.¹⁷

¹⁴ Note that the effect of the passage of time on the promisee is of no consequence for this conclusion.
¹⁵ A discount rate reflects the reduction in value because of the passage of time, while a discount factor reflects what remains after the time has passed. Thus, if the annual discount rate of an individual is 10%, his annual discount factor is 0.909 (1/(1+0.1)).
¹⁶ For a discussion of the difficulty of the courts in determining the subjective value for the promisee, see, for instance, Goetz and Scott (1977, pp. 568-576), Kronman (1978, pp. 360-363) and Muris (1983).
¹⁷ If the prejudgment interest rate is equal to or greater than the promisor's discount rate there will not be excessive breach.
When the promisor's discount factor is greater than the promisee's discount factor, the former can pay the latter to terminate an inefficient contract. However, when this is reversed no pie exists that can be divided between the parties, and the result will be identical to that when renegotiation costs are prohibitive, with renegotiation failing to yield the optimal breach decision.

In addition to these findings, when we consider the possibility that neither party is able to discern the other party's discount factor, we show that under an expectation damages regime the parties may incorrectly choose how to best achieve the desired outcome – whether through renegotiation or through the court system. On the one hand, the parties could find themselves in court even though renegotiation would have succeeded and both parties would have benefitted. Conversely, the parties could find themselves in a renegotiation process that is doomed to fail since the parties may mistakenly believe that there is surplus when there is none.

When we consider the effect of time on a specific performance regime we find that the problems presented above are usually not an issue. This occurs because specific performance is in principle a non-monetary regime, although injunctions may be accompanied by ancillary monetary remedies to compensate the promisee for damages caused by delay in performance or by partial breach. In the absence of such ancillary awards there is no payment from one party to the other, and so the discount factor issue becomes moot and there is always a pie for division which guarantees that there will not be inefficient breach. When the promisee is harmed by the failure of the promisor to perform in the first period (delay), the court might award ancillary monetary payments, however, since these awards are based on the damage incurred because of the delay, the time effect discussed above is unlikely to alter the conclusion. As a result of delay, the pie first shrinks because of the ancillary damages. The award is then a transfer payment from the promisor to the promisee which is meant to compensate the promisee for this loss. The time effect we present in our paper is caused by the difference between the discount factors times the size of the ancillary damages. It is very unlikely that this will be greater than the damage itself, so the pie will not, in general, grow. Still, it is not possible to completely rule out the possibility that the problems discussed above will occur in this case as well. If the ancillary awards are the result of partial breach, i.e., based on damages that exist both if the parties renegotiate and if they go to court, then, indeed, the discussion with
respect to expectation damages holds with specific performance also, albeit to a lesser
degree.

Note how these results differ from those found with standard litigation costs. In the
standard analysis of breach decision it has been shown that if all costs, including
litigation costs, are allocated in court to the promisor, then even when renegotiation is
impossible, the promisor will internalize these costs and breach only when it is
efficient to do so (Sebert 1986, p. 1569). As explained above, with time costs, the
efficiency of breach when renegotiation is impossible depends on the court
determined prejudgment interest rate, and this dependence will hold even if all costs
are shifted to the promisor. When renegotiation is without cost, litigation costs always
lead to a smaller “pie” in court than out of court, and so if the parties have complete
information and they have the same expectations regarding how the court will rule,
they will always prefer renegotiation to litigation, which is efficient. 18 This is not
necessarily the case when the effect of time is considered, as the pie can grow, rather
than shrink, in court. As a result, the parties may find themselves in court proceedings
even if litigation costs are high and renegotiation costs are zero.

The paper is organized as follows. Section 2 considers a situation in which
renegotiation is not economically feasible, and presents the basic setup of the model
and the tools of analysis. We show how, under an expectation damages regime, the
promisor chooses between performance and breach, and how time costs impact this
decision. We then demonstrate how time considerations affect specific performance,
and consider also the effect on punitive damages which can be seen, from a certain
perspective, as an intermediate case since it is, on the one hand, a property rule and,
on the other hand, gives a monetary compensation. In Section 3 we allow for
renegotiation and show how this possibility affects our model when the default
remedy is expectation damages. Section 4 introduces asymmetric information
regarding subjective discount factors and shows the effect in an expectation damages
regime. In Section 5 we analyze punitive damages and specific performance when
renegotiation is possible, both with full information and with asymmetric information.
A short summary and discussion concludes.

18 Note that with standard litigation costs, the decision to litigate when parties are risk neutral can come
about only with some type of asymmetric information or uncertainty. This is not the case with time
costs, as developed in the paper. For analyses of the litigation vs. settlement choice when there are
differing expectations regarding the outcome in court, see, for instance, Shavell (1982). For analyses of
the litigation vs. settlement choice when there is asymmetric information, see, for instance, Bebchuk
2. Choosing Between Performance and Breach of Contract in the Absence of Renegotiation

We begin with a setting in which renegotiation is not economically feasible, i.e., the cost of renegotiation is greater than the surplus realized from the renegotiation, and explain the choice between performance and breach. We then demonstrate how time costs affect this choice. In such a setting, we compare the promisor's decision whether to breach under the two central default remedy regimes that protect the value of the promisee from the contract – expectation damages and specific performance. We also consider another possible remedy – punitive damages – despite the fact that these are not generally awarded in court for breach of contract.\(^{19}\) We do this for two reasons. First, a number of scholars have recommended importing the use of this regime from tort cases into contract law in order to achieve deterrence and full compensation for the promisee.\(^{20}\) Second, punitive damages are, in an important sense, the middle ground between expectation damages and specific performance; the award is of a monetary nature as in the former, and it serves as a property rule like the latter. In a breach of contract context, there are three cases generally discussed in the literature: a production contract that becomes a loss contract for the promisor; the promisee no longer desiring completion of the contract; and a third party arrives and offers to pay more than the contractual price. We chose to analyze the first of these, but considering the other cases would not change any of the qualitative results.

Consider, then, a production contract in which the promisor discovers, ex-post, that the contractual price, \(P\), is lower than the cost to the promisor, \(C\).\(^{21}\) Assume also, for convenience’s sake, that the contractual price was paid up front. Completion of the contract yields a "pie" (total surplus) of \(V - C\), which is divided between the parties as follows: the promisee receives \(V - P > 0\), and the promisor receives \(P - C < 0\). The total surplus can be positive (an efficient contract) or negative (an inefficient contract). If the promisor breaches the contract the case is brought to court, and the consequence for each party depends on the default remedy.

\(^{19}\) The Restatement (Second) of Contracts § 355 (1979) (hereinafter “Restatement Second”) states that “punitive damages are not recoverable for breach of contract unless the conduct constituting the breach is also a tort.”


\(^{21}\) Note that if this possibility was known, the contractual price could have taken into account the possibility that the contract might become a loss contract, and that this might put the contract in jeopardy. Such a possibility does not affect our analysis since once the possibilities have been considered and the contractual price has been agreed upon it is fixed, and once the contract turns out to be a loss contract, the price does not affect the promisor's incentive to breach.
2.1 Expectation Damages

Assume, first, that the default remedy is expectation damages, that court procedures are costless, and that in court the promisor will have to pay the promisee the loss from the breach \( V \) calculated using objective measures such as the “diminution in market value” formula, which allows him to easily compare his alternatives. Assume, furthermore, that this measure accurately reflects the promisee's loss from the breach \( V \). Thus, the promisor knows both the costs of performance and the damages if he breaches. In addition, assume for the moment that court procedures are instantaneous, so there is no need to consider the cost of time. In this case, in court the promisee receives \( V - P \) and the promisor's loss is \( P - V \). The promisor, in choosing whether to breach, will compare between his surplus from performance and his surplus from breach. If \( P - C > P - V \), i.e., if \( V > C \) he will perform, and if \( V < C \) he will be made better off by breaching. Thus, only inefficient contracts are breached.

We present a numerical example that we develop throughout the paper. Say the value of the contract to the promisee \( V \) is 1000 and the cost to the promisor \( C \) is 850. Assume, additionally, that the original contracted price \( P \) was 800. In this case, the contract is efficient \( (V > C) \). If both parties perform, the promisee gains 200, while the promisor loses 50, all told a "pie" of 150. Since, in court, the promisor will have to pay the promisee 200, he will not breach.

If, alternatively, \( C = 1300 \), the contract is not efficient \( (V < C) \). Completion of the contract yields the promisee 200 and the promisor –500. However, the promisor has a different “threat point” since, if he breaches, he loses only 200 after the court decision. Therefore, he will choose to breach. Were it costless to renegotiate, the promisor would offer a payment of 200 to the promisee to terminate the contract immediately, and the promisee would accept since the promisor’s offer is identical to the amount he will receive in court if he wins. Hence, expectation damages mimic the outcome that would be arrived at in a costless renegotiation process.

This analysis, as stated, ignores the issue of time. As mentioned above, court proceedings can take years. When considering today whether to breach, the promisor

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22 For different methods used in calculating damages for breach of contract, see Cooter and Eisenberg (1985, p. 1442).

23 Notice that if the court sets \( V \) lower than the actual damage to the promisee, there will be excessive breach, and if it sets \( V \) higher than the actual damage there will be excessive performance (Shavell 1984, p. 133 and Bishop 1985, p. 300).
compares the nominal immediate cost to the present value of the future payment. This present value is found by discounting the payment awarded in court, including prejudgment interest, by utilizing the promisor's subjective discount factor. Thus, under expectation damages the promisor pays the promisee $V$ plus interest in court. If we denote the interest rate awarded in court as $r$ and the length of the court proceedings as $n$, the monetary award equals $V(1+r)^n$. Denoting by $\varphi$ the yearly discount rate of the promisor, the present value of the court payment is then $V(1+r)^n/(1+\varphi)^n$. In order to simplify the presentation, we calculate the discount factor of the promisor after taking into account prejudgment interest for this entire period (however long), and define it as $\beta$. Thus, $\beta = (1+r)^n/(1+\varphi)^n$, and the present value of the court payment by the promisor is $\beta V$ (i.e., the promisor is indifferent between paying $\beta V$ today and paying $V$ plus interest after a court decision).

It is worth digressing to explain why, in general, it should not be expected that the court awarded interest rate, $r$, will exactly equal the promisor's subjective discount rate, $\varphi$. This is true for two reasons. First, the courts may not have the ability to evaluate the promisor's subjective discount rate. However, even if they can, the court may choose not to award prejudgment interest at all, may award it only partially or for only part of the period, or may use an objective criterion or the promisee's discount rate (in order to compensate him for his loss) when awarding damages. Let us consider these in order.

In principle, a party's discount rate should equal the interest he pays or receives in market transactions. However, such rates may often either be unavailable or may not truly reflect the party's cost of funds, as the interest paid on earlier loans may not reflect the cost of attaining additional funds. This will be particularly problematic for individuals and for small companies with limited or no access to credit markets.\(^{24,25}\)

\(^{24}\) As Schwartz and Scott (2003-2004) state, contracts are written between firms, between individuals and firms and between individuals. It is interesting to note that scholars have noted that breach is most likely to be carried out by individuals or small enterprises and not by large firms whose reputation can be harmed by breach of contract. Thus, we might expect a disproportionate amount of breach specifically in contract involving individuals. For the relationship between reputation and breach of contract, see Kornhauser (1986, pp. 702-705). For a comprehensive discussion see Kornhauser (1983).

\(^{25}\) Even for publicly traded firms the task is not straightforward since there will usually be multiple interest rates that are relevant depending on the specific financial issue in question (lending vs. borrowing rates, secured debt vs. unsecured debt, etc.). It would be difficult, and perhaps impossible, for the court to know which interest rate is appropriate for the specific contract in question. See Knoll (1996-1997, pp. 301-2) for a discussion of this.
For individuals, even when a good credit history is available and certainly when it is not, the ability to borrow may depend on the ability to offer collateral, and when this is limited or the ability to borrow is limited for some other reason, it is not to be expected that the relevant interest rate would equal the interest rate paid for past loans. The same is true with respect to small businesses, which employ about half the nonfarm workforce and produce about half the GDP in the U.S. There has been much theoretical and empirical research regarding the difficulties small businesses face in acquiring credit. Much of the theoretical research has been based on Stiglitz and Weiss (1981) who explained why credit is rationed to certain firms rather than interest rates simply increased for these firms. As Petersen and Rajan (1994) put it, “Since these firms are small, they are unlikely to be monitored by rating agencies or the financial press. As a result, there may be large information asymmetries between these firms and potential public investors. Furthermore, most of these firms are relatively young, with a median age of 10 years. In comparison, firms in the largest decile of New York Stock Exchange stocks have been listed for a median of at least 33 years. Since the youngest firms in our sample do not have much of a track record, a potential lender is uncertain about the competence and trustworthiness of the management, as well as the kinds of investment opportunities that could arise. If lenders remain at arm's length, management can indulge in pet projects, shift risk toward the fixed claim creditors, or otherwise misuse the borrowed funds. Some theorists have argued this is why small and young firms can rarely borrow in the public capital markets … (Diamond (1991)). Much of the available empirical

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26 It has been convincingly demonstrated that for individuals, even when strictly financial issues are involved, temporal choices seem to be unrelated to interest rates, and discount factors can vary wildly across individuals. Thus, for instance, Warner and Pleeter (2001) estimated that the discount rates of U.S. military officers who were offered voluntary separation options were on average 10-19 percent per annum (depending on the estimation procedure used) while those for enlisted men were 35-54 percent per annum on average, neither of which reflect interest rates. In addition, a number of experiments conducted in Denmark show that in strictly monetary situations, discount rates range from close to zero to 60 percent per annum for different individuals (see, e.g., Harrison, Lau and Williams, 2002, Harrison, Lau, Ruström and Sullivan, 2005, and Andersen, Harrison, Lau and Ruström, 2008). 27 The Small Business Economy – A Report to the President. United States Government Printing Office, Washington 2009. In 2004, 77% of the firms in the U.S. were non-employer firms, and 95% had fewer than 10 employees (U.S. Census Bureau, Statistics of U.S. Businesses, Table 2a). Small businesses often struggle to survive in their initial years of existence. According to the Small Business Administration, a third of new employer establishments fail within two years and 56% within four years. 

28 Evidence of these difficulties is presented extensively in government reports. For instance, the Board of Governors of the Federal Reserve System report that “[T]he finding that smaller and younger firms have their loan applications denied more frequently is consistent with the conventional wisdom that these firms are riskier, have shorter credit histories or less collateral to pledge as security, and are more
evidence regarding the lack of access to credit has been made available through organizations such as SBA and its subsidiary SBIC which was established in 1958 as a result of a Federal Reserve study that discovered, in the simplest terms, that small businesses could not get the credit they needed to keep pace with technological advancement, and from reports of the Federal Reserve to the Congress on this issue which, by law, must be presented every five years. For all these reasons, information regarding historical interest rates are unlikely to accurately reflect current discount rates for these firms.

Finally, economic downturns are typified by credit crunches during which even large firms are often blocked from obtaining loans (as witnessed in the past few years). In such periods, relevant discount rates may be difficult to ascertain for even many large firms.

In addition, even when courts can precisely determine the promisor's subjective discount rate, it is unlikely they will choose to set the prejudgment interest rate according to the promisor's discount rate. The main purpose for awarding prejudgment interest (when it is awarded at all) is to protect the plaintiff (the promisee in contract law). Achieving this goal of compensating the successful plaintiff for the loss of time, thereby placing him in the same position as he would have been if he received immediate payment, requires setting the interest rate that is appropriate for the plaintiff, and not the rate that is appropriate for the defendant. In practice,
most jurisdictions that allow payment of prejudgment interest use published rates that are easily obtainable by the parties, and the courts and do not attempt to discern the interest rates of either the plaintiff or the defendant. As Rothschild (1982, pp. 192-193) points out “most prejudgment interest statutes allow for recovery of interest only in certain cases and, even then, at fixed and inadequate rates.”

For all these reasons, it is unlikely that the prejudgment interest rate will equal the promisor's discount rate, and so, it is likely that $\beta$ will differ from 1. It is important to note that this is independent of whether the awarded prejudgment interest precisely reflects the promisee's discount rate (thereby fully compensating him from the breach) or is set in some other manner; as long as the prejudgment interest rate differs from the promisor's discount rate the conclusions below all follow. If the court awarded interest rate is lower than that of the promisor then $\beta < 1$, and if the converse is true then $\beta > 1$. We will discuss both possibilities below.

Returning to the analysis, the promisor's choice, then, is to compare receiving $P - C$ by performing, and $P - \beta V$ in court. He will perform if $\beta V > C$, and breach if $\beta V < C$. Note, in particular, the latter of these. Assume first that $\beta < 1$. In this case there will be instances in which $V > C$, but $\beta V < C$, i.e., the contract is an efficient contract, but the promisor chooses to breach anyway. As a result, expectation damages will lead to too much breach.

Note that the lower $\beta$, i.e., the greater the value of time to the promisor (given the court awarded interest rate), the more likely this is to occur. Denote by $\beta^*$ the critical level of $\beta$ for which the promisor is indifferent between breach and performance,

discount rate might be optimal, in practice it is impossible to know how the plaintiff would have invested the money had he received it immediately, and therefore it is impossible to determine the plaintiff's true opportunity cost. However, we do know that, in practice, the money was invested with the defendant, albeit unwillingly. Therefore, he concludes, the appropriate discount rate is actually that of the defendant, as this reflects the risk that the plaintiff bears in practice. This is sometimes called the “coerced loan” theory. However, as Knoll and Colon (2005) emphasize, this theory is appropriate only when dealing with “two publicly traded companies with ready access to capital markets.” Barondes (2004-5) disagrees with the idea that we should treat the unwilling investment in the defendant's business as the plaintiff's opportunity cost, and sends us back to using the plaintiff's rate.

It should be carefully noted that if the court chooses to, in Knoll's (1996-7) words, “look to the defendant” the effect on the plaintiff could be substantial – if the plaintiff's discount factor is greater than that of the defendant the plaintiff will be undercompensated, while if the converse is the case he will be overcompensated.

See also Knoll (1996-7), p. 316. It should be noted, however, that there is no uniformity even in choosing the “appropriate” objective interest rate: some U.S. states base their rates on the Federal Reserve interest rate, some on the U.S. Treasury rate, some on T-bills; some award interest at precisely the rate as published, others add some percentage to the published rate (between 1% and 4%); some place a cap on the interest rate, others place a floor on it. For details, see http://www.atra.org/issues/index.php?issue=7492.
Then, if $\beta < \bar{\beta}$ the promisor breaches, and if $\beta > \bar{\beta}$ he performs. If, as per our assumption, $\beta < 1$, performance can occur only when $C < V$, i.e., when the contract is efficient. However, this statement cannot be reversed – when the contract is efficient the promisor is not guaranteed to perform, i.e., we get excessive breach. Turning to the case in which $\beta > 1$ the opposite result can also ensue – we can get excessive performance (note that in this case, efficient contracts will always be performed).

Returning to our numerical example, when $C = 850$ the contract is efficient (as stated above), yet the promisor, in deciding whether to breach, compares performance, which costs him an immediate payment of 850, with a payment of $1000\beta$ to the promisee in court. Thus, for example, if $\beta = 0.7$ the promisor compares between performing and paying 850 immediately and paying, in his eyes, $1000*0.7 = 700$ in court after termination of the court proceedings. In this case, the promisor will prefer to breach the efficient contract. It is simple to see that if $\beta > 0.85$ he will perform (an efficient outcome), while if $\beta < 0.85$ he will breach (an inefficient outcome). In this latter case, the efficient contract is breached. If, however, $C = 1300$ and the contract is not efficient, the promisor will efficiently breach as long as $\beta < 1.3$, and perform excessively if $\beta > 1.3$.

To summarize, even if expectation damages precisely reflect the loss to the promisee (prejudgment interest is set equal to the promisee's discount factor, i.e., $\delta$, to be defined below, equals 1), they can exhibit excessive breach. The determined damages are taken by the promisor as no more than a starting point, and these damages are multiplied by a subjective discount factor to arrive at the present value of this award, which is then compared with the immediate cost from performance in order to determine whether to breach.

2.2. Punitive Damages

Consider, now, punitive damages, under which the promisee is awarded damages that are a multiple of the value of the contract.\textsuperscript{35} We denote the amount of damages as $D$, with $D > V$. In the standard analysis, the punitive damages are set high enough so that

\textsuperscript{35} Although, as stated above (supra note 19), Restatement (Second) does not allow punitive damages for breach of contract in general, scholars have suggested that courts allow punitive damages if the breach is willful (see supra note 20 and Bar-Gill and Ben-Shahar, 2008-2009). Dodge (1999, p. 652) suggests to include cases of “a party who deliberately decides not to perform because performance has become more expensive than anticipated.”
the promisor will never breach (Goetz and Scott, 1977 pp. 567-568, Farber, 1980 pp. 1452-1455 and Dodge, 1999 p. 632). When time costs are involved this translates to a situation in which $D$ is set high enough so that $C < \beta D$. Notice, however, that although $D$ is under the control of the court, the court is unlikely to set $\beta$ equal to 1, as discussed above. Thus, it is not at all clear that punitive damages will serve as a property rule; if $C < \beta D$ it indeed serves as a property rule and there will be excessive performance, but if $C > \beta D$ it does not, and, as above, there may actually be excessive breach even under a punitive damages regime.

2.3. Specific Performance

Under specific performance, a court injunction is given ordering the promisor to complete his contractual obligations, albeit in period 2 instead of in period 1. The injunction may be accompanied by an ancillary award to the promisee as a result of losses he incurred either because of the delay in performance or because of partial breach when performance is either defective or incomplete (Yorio 1989, Ch. 9 and Farnsworth 1999, p. 772-773). We denote the cost in the initial period by $C_1$ and that in period 2 by $C_2$. We assume, without loss of generality, that the ancillary award, denoted $A$, is caused by delay, and we measure it at the time of the breach (making it interest bearing in court). Define by $\mu$ the discount factor for the promisor over the entire period, $\mu \equiv 1/(1+\phi)^n$. Then if $C_1 < \mu C_2 + \beta A$ the promisor will perform in the first period, and if $C_1 > \mu C_2 + \beta A$ he will perform after court proceedings. Note that there is no comparison made between the costs and the value of the contract; rather all that is compared is the cost of performance in the two periods. When performance takes place in the first period specific performance is a property rule as discussed in the literature. Thus, since there is no possibility of renegotiation there will be excessive performance, as inefficient contracts are also performed. If

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36 There is a debate whether the length of the legal process is longer under a specific performance regime than under an expectation damages regime. Kronman (1978, p. 362) and Yorio (1989, p. 550) believe the legal process under specific performance is longer, while Schwarz (1979, pp. 292-6) and Ulen (1984, pp. 383-5) believe the converse. Our qualitative conclusions throughout the paper are not dependent on the length of the legal process.

37 This differs from the discount factor used above because with specific performance there is no interest award.

38 In the case of partial breach the promisor can choose between partial performance in the first period or breach, and if he chooses the former, he can choose to compensate the promisee for his loss in the first period or after court proceedings. If $\beta < 1$, he will perform if $C_1 < \mu C_2$ and breach if the converse. If $\beta > 1$, he will perform if $C_1 + A < \mu C_2 + \beta A$ and breach if the converse.
performance takes place in the second period (breach) there is excessive breach, as efficient contracts are also breached.

2.4 Discussion
When renegotiation is not economically feasible there will still be instances of excessive breach under the expectation damages regime. Similarly, punitive damages are not always property rules – it depends on the subjective value of $\beta$ – but if the magnitude of the penalty is sufficiently great it will tend to act like a property rule and consequently result in excessive performance. Specific performance also exhibits tendencies for excessive performance, but in some cases there can be excessive breach with both specific performance and punitive damages.

It is important to notice that, assuming $\beta < 1$, while expectation damages yields instances of excessive breach, we are unable to quantify how often this will occur in order to compare it to the amount of efficient breach yielded by this default remedy. Similarly, with specific performance, in the absence of the possibility of renegotiation there will be instances of excessive performance, but we are unable to quantify it and compare it to the amount of efficient performance yielded by this default remedy. Thus, if renegotiation is not economically feasible, a comparison of the two must rely on empirical evidence and neither can prevail on the basis of theoretical considerations alone. It should be noted that it is doubtful that empirical evidence that can shed light on this question is easily attainable (if at all) given the very essence of subjective discount factors. Most importantly for our discussion, when renegotiation is not an option and $\beta$ is not set equal to 1, and particularly when the court cannot discern the promisor's discount factor, there is no default remedy that can mimic the outcome of a renegotiation.

3. Choosing when Renegotiation is Feasible in an Expectation Damages Regime
Adding the possibility of renegotiation should allow the parties to reach the optimal solution independent of the default remedy (Hermalin, Katz, and Craswell, 2007). Our purpose is to test whether this remains true when time is taken into consideration, i.e., if renegotiation solves the problems uncovered above. In order to isolate the effect of time and to give the different remedies their best chance for success, we will assume that renegotiation is costless, much as we assumed above that court procedures are
costless. Were we to relax this assumption the qualitative findings would not change as long as these costs did not overwhelm other considerations.

The addition of renegotiation turns the situation into a two-person game (rather than just a unilateral decision by the promisor), and requires us to introduce a discount factor for not only the promisor, but also for the promisee. Let $\delta$ be the discount factor of the promisee for the entire period, again, taking into account the interest awarded in court (if the court sets the prejudgment interest rate equal to the promisee's discount rate, then $\delta=1$). This discount factor may differ greatly from that of the promisor, and, in fact, it is to be expected that each party's discount factor would be case dependent, and vary greatly under different circumstances. The present value of the income of the promisee from court proceedings in an expectation damages regime is $\delta V - P$. To keep the presentation straightforward, we will begin with a model of complete information about all values, including subjective discount factors. We will later turn to the setting in which matters may become more difficult for the parties – in a setting under uncertainty. Specifically, we will assume there that information regarding subjective discount factors is private information.

In Figure 1 we consider an efficient contract, and demonstrate how renegotiation can prevent excessive breach in an expectation damages regime.

The original contract point yields a loss for the promisor, but a profit for the promisee. However, the loss to the promisor is smaller than the profit to the promisee (an efficient contract). This is depicted by the line marked "Pareto Efficient Line,"
which is a 45° line through the contract point, which shows all possible divisions of the surplus created by the contract. Note that the fact that this line passes above the origin (where the axes cross and both the promisee and promisor get exactly zero) shows that this is an efficient contract. The outcome in court becomes the "threat point" in any renegotiation; it shows the minimum amount each party will agree to pay/accept in any renegotiation process. The fact that the threat point is below the Pareto Efficient Line shows that the "pie" from performance is greater than the pie in court, and that renegotiation can benefit both parties. All points in the triangle between the threat point and the Pareto Efficient Line are Pareto superior to the threat point, and points along the darkened line segment are both Pareto efficient and Pareto improvements. Ideally, renegotiation would be expected to yield a result along this segment. On the graph we show one possible solution – the Nash Bargaining Solution – however any other solution point is equally valid.

Returning to our analysis, when the promisor discovers that he entered a loss contract, then if $\beta V < C$ he prefers breaching and going to court over performing, regardless of whether the contract is efficient ($V > C$) or inefficient ($V < C$). To test the effect of the possibility of renegotiation on the promisor's decision, we begin with the case of an efficient contract. In this instance, the promisee receives $\delta V - P$ in court and the total pie received by both parties together in court is $(P - \beta V) + (\delta V - P) = (\delta - \beta)V$. If the pie created by performing the efficient contract ($V - C$) is greater than the pie created in court, renegotiation yields a Pareto improvement and therefore allows the parties to complete the contract rather than breach the efficient contract. If, however, this is not the case, the efficient contract will still be breached. The condition reduces to the parties renegotiating if and only if $\delta < \beta + (V - C)/V$.

39 Note that the "benefit" is relative to the threat point, however, it only comes about because the promisor is able to hold up the promisee by threatening breach.

40 Note that this means that if prejudgment interest equals the promisor's discount factor, i.e, $\beta = 1$, there will never be excessive breach, as in Section 2.
Figure 2 shows three different threat points for which the efficient contract is carried out, where the only difference between them is the value of \( \beta \); the higher the discount factor, the lower the threat point. The practical difference between the three points demonstrated is in the comparison between the present value of the payoff in court and the payoff from performance. At threat point 3 the promisor is better off in court than by completing the contract (graphically, he is on a higher point on the vertical axis). Thus, his threat to breach the contract is credible, and hence there is room for renegotiation.\(^{41}\) Threat point 1 depicts a situation where the threat by the promisor to breach the contract is not credible (it is “cheap talk”) since he is worse off in court than by performing the contract. Thus, the promisee will reject any request to renegotiate and the contract will be carried out, which is the efficient outcome. The middle point is the critical threat point in that any higher point will lead to renegotiation regarding the contractual price and performance, and any lower point will lead to performance without renegotiation.\(^{42}\) In all cases, the efficient contract is performed.

\(^{41}\) The solution shown is the Nash Bargaining Solution, however, as stated above, this choice is arbitrary, and any alternative division of the pie is just as valid.

\(^{42}\) Note that while the efficient contract is carried out, it is done only after the promisor is able to extract a higher price from the promisee. Thus, the expectation damages regime has allowed the promisor to improve his situation at the expense of the promisee. If there are renegotiation costs, these are a pure welfare loss; the gain to the promisor from the renegotiation is less than loss to the promisee.
Decreasing the promisor's discount factor even more, we arrive at the possibility that $\delta > \beta + (V - C)/V$. This situation is depicted in Figure 3.

In this case the efficient contract will not be carried out since the threat point is above the first period Pareto line. This occurs if the savings to the promisor from pushing off the payment until the court proceedings are concluded are very substantial from his perspective, while the decrease in value to the promisee caused by the delay is far less consequential. In this case the efficient contract will be breached, and the question becomes will renegotiation be successful in preventing excessive breach.

To address this question, note that the fact that the threat point is above the Pareto Efficient line means that total surplus from court proceedings is greater than from immediate performance, so efficiency may be thought to have increased. Nevertheless, there is an even more efficient outcome in which the efficient contract is fulfilled. This can be accomplished by having the promisee lend the promisor the funds necessary to carry out the contract immediately, and have the funds returned only after a period of time equal to the length of court proceedings. Note that the loan portion of the deal duplicates what happens in court; the court forces the promisee to give a long-term unsecured loan to the promisor, although in court it is accompanied
by breach. In reality, however, it is highly unlikely that the promisee will voluntarily grant such a loan to the promisor under the circumstances (and certainly not one that is unsecured); the fact that the promisor in our case has a very low discount factor means that he might be facing severe financial difficulties and become insolvent, making such a loan particularly unattractive. Moreover, in cases in which there is a good substitute for the good supplied in the contract (which is assumed to be the norm when considering expectation damages), any risk at all will mean that the promisee will be better off not offering such a loan, but will rather recover through the market. If, as we suggest, the promisee would not agree to grant such a loan, renegotiation will not yield a solution to this problem, the promisor will breach the efficient contract, and expectation damages will fail to yield performance of an efficient contract.

The different possibilities are summarized in Figure 4.

43 To demonstrate this, consider the example in the text when \( V = 1000, C = 850 \) and \( P = 800 \), and assume that \( \delta = 1 \) (the prejudgment interest rate fully compensates the promisee for his time costs) and \( \beta = 0.6 \). If the contract is breached the promisee gets \( 1000 - 800 = 200 \) (the same as with performance), and the promisor gets \( 800 - 0.6 \times 1000 = 200 \) (while he would get -50 from performance). In this case, the parties could decide to perform the contract which gives the promisee his \( V \) immediately, but at the same time have the promisee give the promisor a loan with no interest for the entire amount (1000) for a period of time equal to the length of court procedures, so that in reality the promisor has no expenses in the first period. In this case the promisee gets \( 1000 - 800 \) from the contract and \( 1000 - 1000 \) from the loan, for a total of 200, while the promisor gets \( 800 - 850 \) from the contract and \( 1000 - 0.6 \times 1000 \) from the loan, for a total of 350.

44 In the example in footnote 43, the entire surplus from the agreement accrues to the promisor, and therefore any positive probability of insolvency will leave the promisee worse off, and so he will refuse to give the loan. However, even if all of the surplus were to be transferred to the promisee, for a large enough probability of insolvency, the promisee would, in expectation, lose, and therefore be unwilling to grant such a loan. Of course, the decision whether to grant a voluntary loan or not depends totally on the parties, and is not under control of the court.

45 See Supra, note 11.
As seen in the Figure, $\beta$ divides the plane into two areas. If $\beta$ is sufficiently large ($\beta > \beta_0$), expectation damages cause the promisor to perform the efficient contract. If $\beta$ is below this threshold level, the promisor prefers to inefficiently breach. In some instances this excessive breach can be avoided through renegotiation. However, in other instances there is no pie for division between the parties, and so there is no possibility to prevent excessive breach.

To demonstrate this, we return to the example above in which $V = 1000$, $C = 850$ and $P = 800$. As stated, performance gives the promisor $-50$ and the promisee $200$ for a total pie of $150$. Assume that $\delta = 0.9$. As shown above, if $\beta > 0.85$ the promisor performs, and efficiency is achieved. If, however, $\beta < 0.85$, then in the absence of the possibility of renegotiation we saw that the efficient contract is breached. The availability of renegotiation alleviates, but does not solve, the problem of excessive breach. Specifically, if $\beta = 0.75$ then $\delta = \beta + (V - C)/V$, and the pie in court is the same size as the pie from performance. Thus, in court the promisor receives $800 - 0.75 \times 1000 = 50$ and the promisee receives $0.9 \times 1000 - 800 = 100$, yielding a total pie of $150$, the same as from performance. Thus, no benefit can be had from renegotiation. Completing the analysis, if $0.75 < \beta < 0.85$ the situation is as in Figure 2 and renegotiation will be successful in preventing excessive breach, while if $\beta < 0.75$ the situation will be as in Figure 3 and there will still be excessive breach.
Comparing this to the situation when there was no possibility of renegotiation, there will be excessive breach, but it will occur whenever $\beta < 0.75$ instead of whenever $\beta < 0.85$. Thus, as stated, renegotiation has helped reduce excessive breach, but has not wiped it out.

If, however, the contract is inefficient the results change. If $\beta < 1$, the promisor has a credible threat to breach. He compares between the pie in court and the pie from termination of the contract through renegotiation, the latter of which is 0. Thus, renegotiation will succeed as long as $(\delta - \beta)V < 0$, i.e., whenever $\delta < \beta$, and the dispute will end up in court when $\delta > \beta$. In either case the inefficient contract is not carried out, and from this perspective expectation damages successfully leads to contract termination.\(^{46}\)

Note that in this case of a contract that has turned inefficient with full information about values and discount factors, expectation damages give the promisor precise incentives to choose correctly between renegotiation and breach; when it is optimal to renegotiate – i.e., when renegotiation yields a bigger pie than a court decision – the parties will renegotiate, and when it does not, he will breach and send the dispute to the courts. This outcome demonstrates the notion that expectation damages yields efficient breach. But, as shown above, this is not the case when the contract is efficient.

### 4. Expectation Damages with Private Information

Things change with asymmetric information. In reality, it is very likely that neither party can discern the other party's subjective discount factor. Parties will have no incentive to divulge this information, nor will they believe information offered by the other party, since the discount factor of a party could have a crucial effect on the advisability of entering into a contract with another party, and on the bargaining power of each party (Schwartz and Scott, 2003-2004).

For these reasons, in what follows, we assume that the values of $V$ and $C$ are known to all parties and verifiable in court, but such is not the case with respect to subjective discount factors. Note that if the value of $V$ is not observable by the promisor, then the problem raised by asymmetric information is intensified. Since the ideas we will present and the conclusions we will reach in this Section are equally valid for both

\(^{46}\) Note that since the inefficient contract is not carried out in either case, the entire “pie” is created by the loan aspect discussed above.
efficient and inefficient contracts, we will present our analysis for inefficient contracts only; there is no additional insight to be had from presenting both cases since the impact of asymmetric information regarding discount factors is identical in both cases. The reason we choose to present the analysis for inefficient contracts is that until this point expectation damages yielded efficient breach for inefficient contracts but not for efficient contracts. Hence, it is more enlightening to show how and why this ceases to be true specifically in the case that worked until now. In addition, in order to continue to isolate the effect of time on the different remedies, we will assume that renegotiation results in truthful revelation of private information. Thus, we treat the renegotiation process as a “black box” the outcome of which is a separating equilibrium with each party learning the private information of the other party.

Consider, then, a situation in which all parameters, except discount factors, are known to all parties and are verifiable. This includes $V$, $C$, the party's own discount factor, and the distribution of possible discount factors of the other party. To keep the presentation simple, and without loss of generality, we will present the model under the assumption that for each party there are two possible discount factors. Each party knows the portion of each type in the relevant population, but does not discover the discount factor of his trading partner unless and until the renegotiation process takes place.

From the perspective of the promisee, the promisor could have two discount factors $-\beta_1$ and $\beta_2$ – and we assume, without loss of generality, that $\beta_1 > \beta_2$. Similarly, from the promisor's perspective, the promisee's discount factor could be $\delta_1$ or $\delta_2$, with $\delta_1 > \delta_2$. We further assume that $\beta_1 > \delta_1 > \beta_2 > \delta_2$. As shown above, renegotiation is beneficial if and only if $\beta > \delta$. Therefore, it is clear that if $\delta = \delta_2$ there is a pie to be divided from renegotiation, and hence we would expect such a process to succeed. Similarly, if $\beta = \beta_1$ renegotiation is the preferred path. Only when $\delta = \delta_1$ and $\beta = \beta_2$ are court proceedings to be preferred because renegotiation will not yield a solution. The question is what will a promisor with $\beta = \beta_2$ and a promisee with $\delta = \delta_1$ choose to do – enter into a renegotiation process in the hopes of encountering the "right" type of person and finding an immediate solution, or bypass this possibility and head directly to court.

Assume, then, that a portion $p_c$ of promisors are of type 1 (thus, a portion $1 - p_c$ of them are of type 2), and, similarly, a portion $p_p$ of promisees are of type 1. While we
have thus far ignored renegotiation and court costs, we assume that the cost to each party from a failed renegotiation process (above and beyond that of a successful renegotiation process) is $F$, and that the "pie" created by the renegotiation process is split evenly between the parties (again, for simplicity only). This cost could ensue from the amount of time required when the process ends up being unsuccessful or from the duplication in costs from undergoing both a renegotiation process and court proceedings. For simplicity, we also assume the parties are risk-neutral. The same qualitative conclusions will be reached if this assumption is relaxed.

Consider, then, a type 2 promisor trying to decide whether to enter a renegotiation process or breach the contract. If he chooses the former, the process will succeed if the promisee is of type 2, but fail if he is of type 1. The pie created in a successful renegotiation is given by $(\beta_2 - \delta_2)V$, and the promisor is assumed to get half of this. Thus, the promisor's expected income from renegotiation is

$$(1) \quad EI_c = \left(1 - p_p\right)(\beta_2 - \delta_2)V/2 - p_pF.$$

The first term on the right-hand-side of (1) is the benefit from entering the renegotiation process times the probability that the process is successful, and the second term is the cost if it is unsuccessful times the probability that this occurs. Note that the expected income of the promisor depends on the probability distribution of promisee types. The payoff above is in addition to what he receives in court. Denote by $p_p^e$ the critical value of $p_p$ for which $EI_c = 0$ under an expectation damages regime (the superscript "e" denotes expectation damages). A simple manipulation of (1) yields $p_p^e = \frac{(\beta_2 - \delta_2)V/2}{(\beta_2 - \delta_2)V/2 + F}$.

The fraction on the right hand side of this equation is clearly less than one. The promisor will then choose renegotiation if and only if $EI_c > 0$, i.e., if

$$(2) \quad p_p < p_p^e.$$  

Thus, if the probability of type 2 promisee is sufficiently high, this will hold. As seen, the greater the potential pie relative to the cost of failure, the lower the probability of success needs to be to justify entering the process despite the likelihood of failure.

In a similar fashion, a type 2 promisee will agree to the renegotiation process if asked since he knows it will be successful. A type 1 promisee, however, will also agree if he expects to gain from the process. As above, denote by $p_c^e$ the critical value
of $p_c$ for which $EI_p = p_c(\beta_i - \delta_i)V/2 - (1 - p_c)F = 0$, i.e., $\bar{p}_c^e = \frac{F}{(\beta_i - \delta_i)V/2 + F}$.

Since $p_c$ denotes the state of the world in which there is no pie to be divided (the "bad" state of the world), the promisee's expected income will be positive if

(3) $p_c > \bar{p}_c^e$.

Thus, for high enough probability of type 1 promisor this condition will hold.

As stated, both conditions (2) and (3) will hold for some values of $p_p$ and $p_c$. The implication of this is that if conditions (2) and (3) hold, a renegotiation process will be initiated in all cases, independent of the actual values of the subjective discount factors. The renegotiation process itself, however, will sometimes succeed and sometimes fail. In the example just given, the process will fail when the promisor is of type 2 and the promisee of type 1, i.e., a portion $p_p(1 - p_c)$ of the time. If, say, $p_p = p_c = 0.5$, i.e., the distribution is such that for both parties the two types are equally likely, renegotiation will be attempted but fail 25% of the time.47

The opposite occurrence is, of course, also possible. Say condition (2) does not hold. In this case a type 1 promisor will prefer to breach and bring the dispute to court rather than enter a renegotiation process that may fail. However, were a renegotiation process to be entered, it would succeed with probability $1 - p_p$. These opportunities will be missed.

To summarize, an expectation damages regime in the presence of private information with regard to the value of time is likely to lead to non-optimal outcomes. Inefficient contracts will, indeed, be stopped, but often through breach when renegotiation is superior, and when breach is superior the parties could still find themselves in a costly renegotiation process that is doomed to fail because there is no pie to divide. Thus, the inefficiencies displayed from expectation damages are not limited to our findings above that when contracts are efficient, expectation damages lead to excessive breach.

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47 Were we to include renegotiation and court costs explicitly, the expected effects would be found. Specifically, the lower the renegotiation costs relative to court costs, the more likely would be the parties to attempt to renegotiate, i.e., the lower the minimum probability of success would have to be in order for the parties to be willing to take the chance. This means, concurrently, that the lower the renegotiation cost (or the higher the court costs) the higher the probability of failed renegotiations.
5. Other Default remedies

5.1. Punitive Damages

As we saw above, punitive damages do not always serve as a property rule. In cases in which punitive damages serve as a liability rule, such a regime suffers from the same shortcomings as an expectation damages regime – when the contract is efficient there can be excessive breach, and when the contract is inefficient the contract is always terminated/breached, but not always through renegotiation. With asymmetric information regarding discount factors we will also find the same problems as with expectation damages even when the contract is inefficient – there will be cases in which the parties choose renegotiate but the process fails (thereby incurring unnecessary expenditures), and cases in which the parties go to court even though they could have saved costs by renegotiating.

5.2. Specific Performance

As stated, under specific performance a court injunction is given ordering the promisor to complete his contractual obligations, albeit in period 2 instead of in period 1, and this injunction may be accompanied by an ancillary damages award (A) resulting either from the loss to the promisee from the delay in performance or because of partial breach when performance is either defective or incomplete. Assume for now that the ancillary damages are caused by delay. Both the value of the project to the promisee and the cost of the project to the promisor may be different in period 2 than in period 1, and when renegotiation is feasible both of these must be taken into account. We denote the value and cost in the initial period by $V_1$ and $C_1$, respectively, and those in period 2 by $V_2$ and $C_2$. Define by $\rho$ the discount factor for the promisee over the entire period. In such a setting it would generally be the case that $V_1 - C_1 > \rho V_2 - \mu C_2$, i.e., that the total surplus is greater in the first period than in the second period. This should be true for a number of reasons. First, since the asset is being supplied later, the promisee is getting the benefit for a shorter period, which is likely to lower his value. Second, the costs to the supplier could well be expected to increase because the project will have to be restarted at a later period. Finally, and most importantly, if this is not the case, the parties would do well to postpone completion of the contract even if it were not a loss contract, with each party

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48 See supra note 37.
receiving the surplus he gets from immediate performance, and the excess surplus divided somehow between the parties. We will, nevertheless, show that even if this is not the case the problems raised above do not occur with specific performance. We begin with a situation without an ancillary award, i.e., when $A = 0$.

Consider, first, a situation with full information. In this case, if, as expected, $V_1 - C_1 > \rho V_2 - \mu C_2$, then if the contract is efficient ($V_1 - C_1 > 0$) the parties will choose immediate performance and some split of the surplus (unless the threat is not credible, $C_1 < \mu C_2$, in which case the promisee need not pay the promisor anything extra in order to get compliance). If the contract is inefficient, the parties will desire immediate termination of the contract, and the surplus from termination will be divided, as above, between the parties. If $V_1 - C_1 < \rho V_2 - \mu C_2$, then if the contract is efficient in the second period the parties will choose to perform then, while if it is inefficient they will again choose termination.

Note that in all cases a pie exists from either performing the efficient contract in the period in which it yields the greatest surplus or terminating an inefficient contract. Thus, the renegotiation process will always succeed – there is never a situation where they will end up in court, since court will just lead them to performance in the second period. The same continues to hold when there is private information about discount factors. If the parties are uncertain ex-ante whether discount factors are such that the optimal action is to terminate, perform in the first period or perform in the second period, they will enter a renegotiation process which is guaranteed to succeed in choosing the optimal outcome once discount factors are discovered. Thus, specific performance always serves as a property rule, and does not suffer from the shortcomings discussed above for expectation damages and punitive damages.

These conclusions can theoretically change when there are ancillary damages awarded to compensate the promisee for delay, although this is highly unlikely, as explained below. To demonstrate this, consider the case in which $V_1 - C_1 > \rho V_2 - \mu C_2$, and assume that the decrease in value to the promisee results solely from the ancillary damages, which are assumed to be incurred in period 1, and from the passage of time. In addition, assume that even in the absence of ancillary damages, i.e., when $A = 0$, the pie in the first period is greater than in the second period, i.e.,

(4) $V_1 - C_1 > \rho V_1 - \mu C_2$.  

Adding in the ancillary damages without a court award, it is clear that if (4) holds, then

\( V_1 - C_1 > [\rho V_1 - A] - \mu C_2. \)

When we add in the court award, the condition for performance becomes

\( V_1 - C_1 > \rho V_1 - A + \delta A - [\mu C_2 + \beta A] = \rho V_1 - \mu C_2 - (1 - \delta + \beta)A, \)

and (4) guarantees (6) if \((1 - \delta + \beta) \geq 0\). If the court awarded interest rate is zero then \(\delta = \rho < 1\) and this inequality holds.\(^{49}\) It also holds if prejudgment interest is set equal to the promisee's discount rate \((\delta = 1)\). However if the interest rate is very high so that \(\delta >> 1\) and, despite this, the discount factor of the promisor is very low, this inequality can be reversed. Note that the condition for failure with expectation damages was simply \(\delta > \beta\), or \(\delta - \beta > 0\), while here failure requires that \(\delta - \beta > 1\), which is far less likely to occur. It should be noted, however, that while \(\delta - \beta > 1\) is a necessary condition for the inequality in (6) to be reversed, it is not a sufficient condition; since from (4) we know that \(V_1 - C_1 > \rho V_1 - \mu C_2\), the time effect from the ancillary award would have to be great enough to overcome the natural shrinking of the pie from perfect performance in the second period (keeping \(V\) constant) rather than in the first period. This is less likely to occur the smaller the ancillary award relative to the value of the contract.

Finally, if ancillary awards result from partial breach, the outcome becomes more similar to expectation damages since \(A\) is subtracted from both sides of the equation when going from (4) to (5). Thus, the required condition will be

\( V_1 - C_1 > \rho V_1 - \mu C_2 - (\beta - \delta)A, \)

This is similar to the condition with expectation damages, but, as above, the sign of \(\beta - \delta\) is only part of the equation, and the fact that monetary awards are by definition a smaller part of specific performance than of expectation damages still make the potential problem less acute with specific performance than with expectation damages.

\(^{49}\) By definition of the terms, \(\beta\) and \(\delta\) include court awarded interest payments and are applied to court awarded monetary payments, while \(\rho\) and \(\mu\) do not. Specifically, \(\delta = (1 + r)^n \rho\) and \(\beta = (1 + r)^n \mu\).
6. Conclusions
In this paper we considered the effect of time on default remedies for breach of contract, and specifically on the incentive to terminate inefficient contracts. Clearly, one of the main benefits to the promisor from breaching a contract lies in the possibility to push off payment until after court proceedings have been exhausted, which can be quite a long time. This can have a major effect on the efficiency of various default remedies. We have shown that default remedies that determine monetary awards (such as expectation damages) are quite sensitive to discount factors and can lead to distortions in the decision whether to breach.\textsuperscript{50} Put differently, if courts cannot or will not award prejudgment interest according to the promisor's discount rate, there is no liability rule than can mimic the renegotiation outcome. Consequently, research should focus on attaining a deeper understanding of the renegotiation process in order to determine whether and how different default rules affect the likelihood of it ending successfully. What we have thus far shown is that even if the renegotiation process is assumed to yield complete and truthful revelation of private information, renegotiation will fail to yield an immediate settlement under an expectation damages regime whenever the promisor's discount factor is higher than the promisee's discount factor. As a result, if discount factors are private information and the parties know that this information will be revealed during renegotiation, they may enter a renegotiation process that is \textit{doomed to fail}. This, however, does not generally happen with specific performance even in the unusual case in which the

\textsuperscript{50} We have been asked whether the parties can agree on stipulated damages clauses to resolve the inefficiencies. While we have not explored this question fully, we believe some problems arise with this solution. In general, in a setting of full information we would think the parties would want to stipulate court prejudgment interest in favor of the promisor's subjective discount rate so that only inefficient contracts will be breached. This is done by adjusting the contractual price to compensate the party injured by such a stipulation (Schwarz 1990). However, if the promisor's discount factor is greater than the promisee's discount factor two problems exist. First, the court may not enforce these damages because they exceed the harm from breach (Schwartz 1990, p. 369 and Goetz and Scott 1977, p. 556). Second, this is not the optimal discount rate for the parties because the pie, in this case, grows in court. Thus, if the parties choose the discount rate so that $\beta=1$ (and, therefore, $\delta>1$), then when $C=V$ the promisor will be indifferent between performing and breaching, \textit{but the promisee prefers that the contract be breached}. In fact, the promisee, for this reason, prefers that there be inefficient breach, and so he prefers that a lower interest rate be stipulated. This will increase the pie for the two parties together, and is therefore superior to choosing the promisor's discount factor. Thus, the efficient breach condition is not achieved in equilibrium.

If one considers a setting with private information, additional complications arise. As Schwartz (1990, p. 366) and Schwarz and Scott (2003) point out, discount factors reflect bargaining power, and a promisor with a high discount factor or with private information regarding the probability of breach has little incentive to disclose this information to the promisee, as these are likely to affect the terms of the contract. Thus, it is likely that the parties will not achieve the optimal outcome. A more careful analysis of these ideas is left to future research.
surplus created from the contract is enhanced by pushing off performance or when the injunction is accompanied by an ancillary payment to compensate the promisee for his losses.

It is worth taking a moment to understand why this occurs. When the remedy is of a monetary nature, both renegotiation and going to court yield payment from the promisor to the promisee, with the difference between them being when the payment is made, in the first period or in the second period. This can cause the renegotiation process to break down even when it is costless. However, assuming there are no ancillary awards, when the remedy is an injunction and performance in the second period yields a larger pie than performance in the first period (the unusual case), both renegotiation and court procedures will yield the same outcome (performance) at the same point in time (in the second period). Thus, the only difference is that the parties save having to go to court, so the pie is always shrinking. For this reason, specific performance outperforms an expectation damages regime in creating efficient incentives for the parties to resolve their dispute. With this, even a specific performance regime can at most guarantee that renegotiation may succeed (since there will always be a pie to divide between the parties) but cannot guarantee that the process will terminate successfully. One valuable path of research might be to try to assess which regimes are most likely to make the parties comprehend that the longer the dispute persists the more the surplus pie shrinks, thus increasing the likelihood that renegotiating will succeed without court intervention.
References


