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On and Off Contract Remedies

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Abstract

A party dissatisfied with the contractual performance of a counterparty is typically able to pursue a variety of legal recourses. Within this apparent variety lurk two fundamental alternatives. The aggrieved party may (i) "affirm" the contract and seek money damages or specific performance; or (ii) "disaffirm" the contract with the remedy of rescission and restitution. This simple dichotomy of contract remedies applies broadly in both common law and civil law practice. We show here that this remedial regime allows parties to write simple contracts that induce first-best cooperative investments.

Keywords: breach remedies, incomplete contracts, cooperative investments.

JEL-Classification: K12, L22, J41, C70.

1 Introduction

The expansive contract literature concerning the efficiency of alternative remedial regimes is surprisingly inattentive to the remedy of "rescission and restitution." Rescission and restitution, like money damages and specific performance, is an ordinary remedy for breach of contract. Yet, unlike damages and specific performance, rescission and restitution entails a disaffirmation of the underlying contract. That is, a disappointed promisee can rescind the contract and get back any benefits conveyed upon the promisor (i.e., restitution). Availing

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this option has long been part of the common law tradition. This option was also available under the Roman model law of aedilitian remedies, which significantly influenced many civil law jurisdictions and the drafters of the Vienna Convention.[1] The aedilitian remedies were introduced by the curule aediles (the Roman market police) and allowed the victim of non-conforming delivery to choose between 'actio redhibitoria' (rejection and restitution) and 'actio quanti minoris' (acceptance and apportionment).[2] Modern contract scholars, including those in law and economics, have lost sight of this old and customary "distinction between actions that were brought 'on' and 'off' the contract. The idea was that the injured party either affirmed the contract, by seeking damages for breach, or else disaffirmed it, by attempting to unwind the exchange..." (Kull, 2006). While academics may have abandoned this doctrinal distinction, rescission and restitution remains a viable alternative to damages and specific enforcement in practice. It is often an attractive expedient to the cost of proving money damages or monitoring specific performance. Moreover, as we establish below, the option to pursue rescission and restitution or expectation damages, enables parties to write contracts that allow for efficient investment in situations where contract theorists have shown that expectation damages alone would induce no investment. This result, however, is contingent on a model that doesn't fully capture important features of the legal framework within which parties typically contract. Our analysis highlights the importance of modeling carefully details of the legal framework; these details are not just embellishments of legal doctrine, they often meaningfully influence behavior and may allow parties to achieve efficient outcomes in various contracting environments.

The contracting environment we consider is one where a buyer and seller, both risk-neutral, enter a contract for the future delivery of one unit of a good of specified quality for a fixed price. Before delivering the good the seller makes an investment that is both *relationship-specific* and *cooperative*, which is to say the investment has no value outside of the relationship between the parties and it increases the buyer's value (as opposed to a *selfish*

[1] See Basedow (2005).

[2] See e.g. Zimmermann (1996), pp. 311ff.

investment that lowers the seller's cost). An illustration may be useful. Take the transaction at issue in *Tennessee Carolina Transportation Inc. v. Strict Corp*,[3] wherein a common cargo trucking company enters an agreement with a trailer manufacturer, Strict Corp., for 150 new trailers at a contract price of $854,250.00. Imagine that before manufacturing begins, Strict investigates the shipping business of the trucking company to determine the best trailer design for *that* company, given the cargo it commonly hauls, the average distances traveled, the road surfaces and weather conditions the company's drivers typically face and so on. For example, if the trucking company tends to ship lighter freight, like shoes, then the trailer frame may best be constructed using a less dense metal alloy or aluminum, which would significantly economize on fuel usage over time. Different designs are optimal if the company ships weightier freight, like major appliances, or if its shipping routes entail flat or mountainous terrain or severe weather, such as snow or ice or extreme desert heat. Strict's investment in understanding the trucking company's business is relationship-specific in that the information it acquires cannot be fully deployed in the design of trailers for other clients, who ship different products over other routes. Moreover, as Strict's investment will lower the average costs of the trucking company's operations it is also cooperative.

In the legal regime we envisage the promisee has a choice, in the case of nonperformance or nonconforming performance, between *affirming* the contract and seeking expectation damages or *disaffirming* the contract with the remedy of rescission and restitution. We will show that, given this regime and the contracting environment described above, parties are able to induce first-best cooperative investments by writing simple fixed-price contracts.[4] Contrasts this with the result by Che and Hausch in their seminal 1999 article, which made salient the

[3] 196 S.E.2d 711, 1973.

[4] The real world relevance of settings where cooperative investments are important can hardly be underestimated. Take, e.g., a business software developer like Oracle whose products can be used across a variety of different industries but need to be customized to the special needs of individual clients. In a first stage, Oracle sends in a team of consultants which tries to understand the client's business processes before starting with the actual implementation of the software solution. It is clear that the investment Oracle makes in order to understand the business processes of client A does not help it to better understand the business processes of client B (hence the investment is relationship- specific). It is equally obvious that the more effort Oracle exerts to understand the needs of its client, the lower (on average) will be its future operating costs (hence the investment is cooperative).

notion of cooperative investments.[5] Assuming an informational framework that implicitly allowed only for specific performance, Che and Hausch observed that contracts do no better than no contract at all when investments are cooperative (irrelevance of contracting). Che and Chung (1999) followed by considering an informational environment that allowed for other forms of contract remedies and concluded that expectation damages, the common law default remedy, induces zero cooperative investments. Stremitzer (2008b) further enriched the assumed legal environment by accounting for warranties (expressed and implied) and demonstrated that expectation damages induce positive cooperative investments and can even achieve the first-best if the quality specification in the contract is set to the highest technically feasible level—so-called Cadillac contracts.[6] However, this is unattractive as a positive theory of how people induce positive cooperative investments as we do not usually observe Cadillac contracts in the real world. In this paper, we show that by including yet another ordinary feature of law, namely the option to sue off-the contract, the first-best can be achieved for any chosen quality levels.

The paper is organized as follows: Section 2 gives an overview of the burgeoning literature on how simple contracts in combination with common breach remedies of contract law can help to induce efficient investments. Section 3 describes our model. In Section 4, we work out two benchmarks: the socially optimal level of investment and the investment level absent institutional arrangements. Our main result is derived in Section 5. Section 6 concludes.

2 Related Literature

It is well known that if relationship-specific investments are not adequately protected by a contract the danger of hold-up will lead parties to invest less than the socially optimal level (Williamson 1979, 1985; Grout, 1984; Grossman and Hart, 1986; Hart and Moore, 1988).

[5] We borrow the term "cooperative investments" from Che and Hausch (1999). They were first studied in an incomplete contract setting by MacLeod and Malcomson (1993) and are also referred to as "cross investments" (e.g. Guriev, 2003) or "investments with externalities" (e.g. Nöldeke and Schmidt, 1995). Other articles that consider cooperative investments include e.g. Bernheim and Whinston (1998), Maskin and Moore (1999), De Fraja (1999), Rosenkranz and Schmitz (1999), Segal and Whinston (2002), and Roider (2004).

[6] The term "Cadillace contract" was coined by Edlin (1996).

A large literature has developed showing that a combination of *simple* contracts (specifying little more than the good to be exchanged and the price to be paid) and standard breach remedies can solve this hold-up problem. Yet, most of the literature, starting with the seminal papers by Shavell (1980, 1984) and Rogerson (1984), has focused exclusively on selfish investments where, for example, a seller invests in order to reduce her cost or a buyer invests in order to increase his benefit from the procured good or service. In recent years, starting with Che and Chung (1999), a small literature on cooperative investments has emerged. Che and Chung (1999) show that, with costless renegotiation, a simple contract (i.e., one that does not condition on investment) achieves the first best if the contract is governed by a regime of 'reliance damages'—a standard remedy of contract law under which the court orders the breaching party (promisor) to reimburse the promisee's reliance expenditures on the contract, including its investment. But they also derive the troubling result that the common law default remedy of expectation damages, wherein the court orders the promisor to compensate the promisee by putting him in as good a position as if the contract had been performed, does not induce *any* cooperative investments.

This result, however, is seemingly contradicted by Schweizer (2006), who shows that a regime of "bilateral expectation damages" can achieve the first best. The difference in results stems from Schweizer's assumption that a party can also claim damages if the counterparty underinvested relative to the level specified in the contract, while Che and Chung (1999) assume that the contract does not condition on investments. Stremitzer (2008b) revisits 'expectation damages' in the same framework as Che and Chung (1999) and shows that their zero cooperative investments result follows from the implicit assumption that the contract stays silent in terms of *required quality.* Yet, this assumption is unrealistic. Even if the parties do not stipulate an explicit quality level in their contract (such as an express warranty), the court will do it for them by default. For example, by requiring the good to serve its ordinary purpose (implied warranty of merchantability) courts establish a minimum quality threshold.[7] Taking this feature of real world contracting into account,

[7]See Sections 2-314 and 2-315 of the Uniform Commercial Code (UCC). The analysis of Che and Chung

Stremitzer (2008b) shows that expectation damages will always induce positive levels of cooperative investments. Indeed, it is possible to achieve the first best by writing so-called Cadillac contracts which stipulate the highest possible quality as the required quality level under the contract. Moreover, this result holds even if, because of *non-verifiability of investments*, both 'expectation damages' as proposed by Schweizer (2006) and 'reliance damages' as advocated by Che and Chung (1999) are not available.[8] Cadillac contracts, however, are seldom observed in practice, although examples may be found.[9] In the above case, *Tennessee Carolina Transportation Inc. v. Strict Corp.*, Strict Corp. had not agreed with Tennessee Carolina Transportation to build a truck whose technical specifications could not be met at the current state of technology, and it is highly doubtful that such contracts would be found in similar situations. This makes the result by Stremitzer (2008b) unappealing as a positive theory of how parties induce first-best cooperative investments. Under the regime considered in this paper, which is modelled closely to the more complex optional nature of real world contracting,[10] we show that first-best cooperative investments can also be achieved for the more common agreements where parties stipulate intermediate quality levels.

3 The model

A buyer and a seller potentially trade a good. Both parties are risk neutral. In the first period, the seller makes a relationship-specific cooperative investment, $e \in \mathbb{R}_0^+$. The buyer's benefit from trade, v, is a random variable stochastically determined by the amount of the seller's investment, e, measured in money terms. The scrap or resale value of the good to

(1999) continues to apply if parties contract arround implicit warranties without replacing them with "express warranties". Moreover, in labour contracts, stipulating a required quality level might not be possible as a matter of law.

[8] Stremitzer (2008b) also shows that an optional regime combining specific performance and restitution can induce first-best cooperative investments.

[9] See Edlin (1996). A real world example of such Cadillac contracts would be the contracts offered by moving companies. They usually promise to deliver all their client's belongings to his new residence *intact*. This is as valuable as the company's performance can be, as most of the time, the company falls short of its promise and will have to compensate its client.

[10] Other papers exploiting the optional structure of real world remedy regimes are Priest (1978), Avraham and Liu (2006), Brooks (2006) and Stremitzer (2008a).

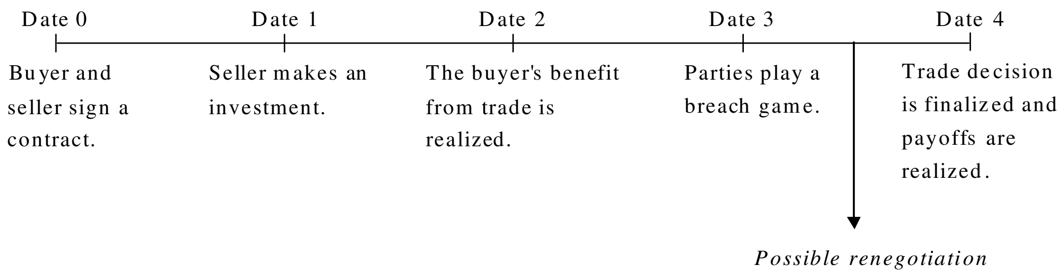

Figure 1: Timeline.

the seller is 0.[11] The cost of the seller's performance is deterministic and equal to a known constant, $c > 0$. That is, the seller's investment is cooperative, and there are no selfish investments. This setting is identical to the setting studied in Che and Chung (1999).

The timing of the model, depicted in Figure 1, is as follows: At date 0, the buyer and the seller sign a contract. The contract specifies a fixed price p to be paid by the buyer upon performance as stipulated in the contract. It also specifies a quality level $\bar{v}$ and a lump sum payment t made by the buyer to the seller. At date 1, the seller makes a cooperative investment: $e \geq 0$. At date 2, the buyer's benefit from the seller's performance, v, is drawn from $[0, v_h]$ by the distribution function $F(\cdot\,|e)$.[12] The seller's cost of performance is deterministic and equal to c, where $0 \leq c < v_h$. At date 3, the parties play a breach game, in which they announce their willingness to deliver or accept the good and choose among the available breach remedies. This game will be explained in more detail below.

We assume that renegotiation has no associated costs and can occur at any time after date 3 and before the seller actually performs at date 4. The parties split the surplus from renegotiation at an exogenously given fixed ratio, with the seller receiving a share $\alpha \in [0, 1]$.[13] Under this assumption, the buyer's choice of legal remedy can be reversed whenever reversing it is mutually beneficial for both parties.

As we consider an optional legal regime which gives the victim of breach the option to

[11] Consequently there cannot be a threat point effect like in Edlin and Hermalin (2000).

[12] This means parties have to live with the v which is realized at this stage: namely, cure will not be an option should the good turn out to be non-conforming, $v < \bar{v}$, and therefore specific performance is unavailalble in this case.

[13] The same ex-post bargaining setup was used by Edlin and Reichelstein (1996).

choose between expectation damages and restitution we make the following informational assumptions: In order to calculate expectation damages, the court must be able to observe the buyer's valuation and the seller's variable cost. For restitution, it must be observable whether the buyer's benefit from performance lies below or above a certain threshold level $\bar{v}$. The seller's choice of investment may be private information. Everything else, however, is observable by the parties. The following technical assumptions are made throughout:

Assumption 1 $F(\cdot|\cdot)$ is twice continuously differentiable.

Assumption 2 $F_e(\cdot|e) < 0$ and $F_{ee}(\cdot|e) > 0$ for all v in $(0, v_h)$ and for all $e \geq 0$.

Assumption 3 $F_e(v|0) = -\infty$ and $F_e(v|\infty) = 0$ for all v in $(0, v_h)$.

Assumption 2 means that an increase in e moves the distribution in the sense of the first-order stochastic dominance at a decreasing rate, while Assumption 3 ensures an interior solution.

4 Benchmark

As a benchmark, we consider the first-best outcome. It has two components: (i) the efficient trade decision has trade occur if and only if $v \geq c$, and (ii) the efficient investment level e_0, maximizes the net expected gains from trade, conditional on the efficient trade decision:

$$e_0 \in \arg\max_e W(e) \equiv \arg\max_e \int_c^{v_h} (v-c)\ F_v(v|e)\ dv - e. \tag{1}$$

Integrating (1) by parts, the efficient investment level, e_0, is characterized by the following first-order condition:

$$W'(e_0) = -\int_c^{v_h} F_e(v|e_0)\ dv - 1 = 0. \tag{2}$$

If parties do not contract but simply bargain at date 3, they will split the gains of trade according to their respective bargaining power. The seller's expected payoff will then be:

$$U_n(e) \equiv \alpha \int_c^{v_h} (v-c)\ F_v(v|e)\ dv - e. \tag{3}$$

Integrating by parts and differentiating, we can write the first-order condition for the seller's optimal investment decision e_n:

$$U_n'(e_n) \equiv -\alpha \int_c^{v_h} F_e(v\,|e_n)\; dv - 1 = 0. \tag{4}$$

As $F_e(v\,|\cdot) < 0$ and $F_{ee}(v\,|\cdot) > 0$, it can be seen that the seller underinvests: $e_n < e_0$. By Assumptions 2 and 3, both e_0 and e_n are unique, finite, and strictly positive.

5 Legal Regime

We consider an optional legal regime where, in the case of nonperformance or nonconforming performance, the promisee has a choice between *disaffirming* the contract with the remedy of rescission and restitution or *affirming* the contract and seeking expectation damages or specific performance.

We now describe the breach game induced by this regime (hereafter referred to as the *on/off-contract-remedy* regime). After realization of the buyer's value at date 2, the seller can either announce his intention to deliver or not (Figure 2). If the seller refuses to deliver $(\bar{D})$, the buyer can choose to disaffirm the contract $\left(\bar{A}\right)$ with the rescission and restitution remedy (RR) or affirm the contract (A) and receive expectation damages (ED). Additionally, we assume that the buyer can always prevent opportunistic breach by the seller by compelling deliver of the good, which in a slight abuse of terminology we label specific performance (SP).[14] If the buyer chooses to compel the seller's delivery using specific performance,

[14] Our usage of "specific performance" here should be interpreted as forcing the seller to deliver the good as realized, not as contracted for by the parties. We allow the buyer to compel deliver in order to rule out opportunistic breaches by the seller. For example, imagine that Strict Corp., the trailer manufacturer, develops a trailor which is much better than required under the contract, $v >> \bar{v}$. By breaching the contract, it only has to pay damages of $\bar{v} - p$. This may be less than the seller's share in the renegotiation surplus which is $\alpha(v - c)$. Given that the good is relationship specific, it is obvious that the seller does not breach the contract because he has found another buyer with higher valuation. The seller's only objective can be to extract additional surplus from the buyer in renegotiation. Courts are, however, reluctant to lend their hand to a party which breaches strategically in order to increase its bargaining leverage. See Nothern Ind. Pub. Serv. Co. v. Carbon County Coal Co., 799 F.2d 265, 279-80 (7th Cir. 1986). See also Richard Posner (2003), pp. 118/119 and Restatement Third, Restitution and Unjust Enrichment, Tentative Draft No. 6, American Law Institute, Andrew Kull (reporter) (2008), §39.

payoffs are:

$$\begin{aligned}\Pi_S\left(\bar{D},\ SP\right) &= p-c+\alpha[c-v]^+ \text{ and} \\ \Pi_B\left(\bar{D},\ SP\right) &= v-p+(1-\alpha)\,[c-v]^+.\end{aligned} \tag{5}$$

We assume throughout that parties will renegotiate towards the efficient ex-post trade decision. As, under specific performance, the court orders the good to be traded, parties only need to renegotiate if $c > v$. When the buyer chooses expectation damages, renegotiations will only occur for $v > c$ and payoffs are:

$$\begin{aligned}\Pi_S\left(\bar{D},\ ED\right) &= -[\bar{v}-p]^+ + \alpha\,[v-c]^+ \text{ and} \\ \Pi_B\left(\bar{D},\ ED\right) &= [\bar{v}-p]^+ + (1-\alpha)\,[v-c]^+.\end{aligned} \tag{6}$$

We allow the buyer to disaffirm $\left(\bar{A}\right)$ the contract with the rescission and restitution remedy if the seller refuses to deliver $(\bar{D})$, but observe that this remedy is dominated by expectation damages as $[v-p]^+ \geq 0$ and will therefore never be chosen by the buyer in equilibrium.

In the case where the seller announces delivery (D), the buyer declares whether he intends to affirm or disaffirm. If he affirms (A), the good is traded. The seller incurs production cost c and receives price p but has to compensate the buyer for the non-conformity, $\bar{v}-v$. Payoffs will be:

$$\begin{aligned}\Pi_S\left(D,\ A\right) &= p-c-[\bar{v}-v]^+ + \alpha\,[c-v]^+ \text{ and} \\ \Pi_B\left(D,\ A\right) &= v-p+[\bar{v}-v]^+ + (1-\alpha)\,[c-v]^+.\end{aligned} \tag{7}$$

If the buyer chooses to disaffirm and reject the seller's tender $\left(\bar{A}\right)$, legal consequences differ depending on whether the tendered good was conforming to the contract (i) or not (ii).

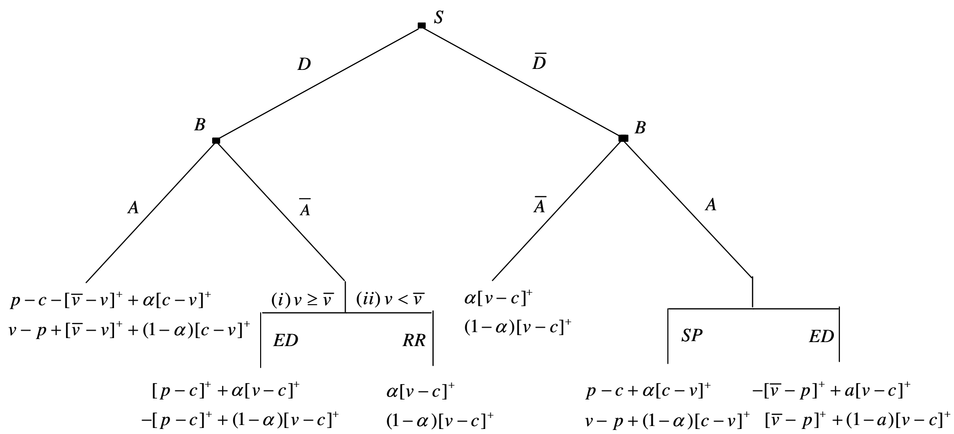

Figure 2: Subgame induced by the on/off-contract-remedy regime.

(i) Conforming tender $\mathbf{v} \geq \bar{\mathbf{v}}$. If the buyer rejects a conforming tender, the seller can recover damages of $[p-c]^{+}$. Payoffs will be:

$$\begin{aligned} \Pi_S\left(D,\ \bar{A}\right) &= [p-c]^{+}+\alpha[v-c]^{+} \text{ and} \\ \Pi_B\left(D,\ \bar{A}\right) &= -[p-c]^{+}+(1-\alpha)\,[v-c]^{+}. \end{aligned} \tag{8}$$

As we will later show, our efficiency results do not require that both the quality threshold and the price be set below variable cost. Henceforth, we will therefore rule out the case where $\bar{v} < c \wedge p < c$.[15] This allows us to prove the following lemma:

Lemma 1 *If the good is conforming to the contract, $v \geq \bar{v}$, the seller will realize equilibrium payoff $p - c$.*

Proof. Appendix A1. ■

(ii) Non-conforming tender $v < \bar{v}$. If the tender is non-conforming to the contract, the buyer does not become liable for rejecting delivery. On the contrary, the buyer has the legal right to rescind the contract and to ask for restitution. He can recover any progress payment that he might have made to the seller. Therefore, the parties' payoffs are confined to their

[15] Ruling out this case saves us tedious case distinctions.

share in the renegotiation surplus:

$$\Pi_S\left(D,\ \bar{A}\right) = \alpha[v-c]^+ \text{ and} \qquad (9)$$
$$\Pi_B\left(D,\ \bar{A}\right) = (1-\alpha)\,[v-c]^+.$$

Solving the subgame, given that the seller has announced not to deliver ($\bar{D}$), we can prove the following lemma:

Lemma 2 *If the good is non-conforming, $v<\bar{v}$, it will never be optimal for the buyer to choose specific performance.*

Proof. Appendix A2. ■

We now look at the subgame, given that the seller announces delivery (D), and find that it can only be optimal for the buyer to affirm (A) if:

$$\bar{v}-p+(1-\alpha)\,[c-v]^+ \geq (1-\alpha)\,[v-c]^+\,. \qquad (10)$$

Rearranging this condition, it can be written as:

$$v \leq \frac{\bar{v}-p}{1-\alpha}+c \equiv \hat{v} \qquad (11)$$

which is very intuitive, as the buyer is more likely to disaffirm the contract and renegotiate if the renegotiation surplus is high (high v), and if he can expect a big share in the renegotiation surplus (low α). We can now prove the following lemma:

Lemma 3 *If the good is non-conforming to the contract, $v<\bar{v}$, the following holds for the seller's equilibrium payoff: 1) If $p<\bar{v}$, the seller's payoff will be $-(\bar{v}-p)$ for $0\leq v\leq c$, $p-c-(\bar{v}-v)$ for $c<v<\hat{v}$, and $\alpha(v-c)$ for $v>\hat{v}$. 2) If $p\geq\bar{v}$, his payoff will be 0 for $0 \leq v\leq c$, and $\alpha(v-c)$ for $v>c$.*

Proof. Appendix A3. ■

Figure 3 summarizes Lemmas 1-3.[16] We can now prove the following proposition:

[16] Note that we do not wish to imply by Figure 3 that intervals are always non-empty.

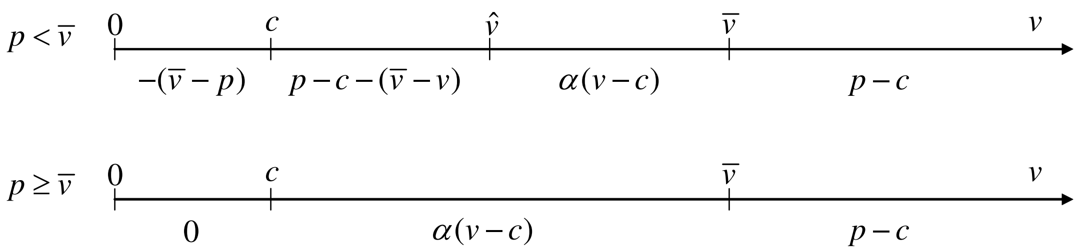

Figure 3: Seller's equilibrium payoffs under on/off-contract remedy regime..

Proposition 1 *Consider a regime, which, if performance is nonconforming ($v < \bar{v}$), allows the buyer to choose between (i) affirmation with the expectation damages remedy or (ii) disaffirmation followed by rescission and restitution. In the case of nonperformance, the buyer can choose among (i) specific performance, (ii) expectation damages or (iii) rescission and restitution. Then, for any threshold value $\bar{v} \in (0, v_h]$, there exists a price $\hat{p}$ which induces first-best cooperative investments.*

Proof. The proof comes in two parts. (i) First, we show that the first best can be achieved if the threshold is set below or at variable cost, $\bar{v} \leq c$. (ii) Then, we show that this is also true for $\bar{v} > c$.[17]

(i) Suppose that $\bar{v} \leq c$. Further assume that the optimal price, $\hat{p}$, will exceed variable cost:

$$\hat{p} > c. \tag{12}$$

Then, by $\bar{v} \leq c$ it follows that $\hat{p} > \bar{v}$, such that the seller's payoff will be 0 for all $v \in (0,\ \bar{v})$ and $p - c$ for $v \geq \bar{v}$. Therefore, the seller's expected payoff is:

$$U(e, p) \equiv (p - c)\,(1 - F\,(\bar{v}\,|e\,)) - e. \tag{13}$$

Taking partial derivatives with respect to e we get:

$$U'(e, p) \equiv -\,(p - c)\,F_e\,(\bar{v}\,|e\,) - 1. \tag{14}$$

[17]Note that we will not assume $\bar{v} < c \wedge p \leq c$ in any part of the proof, so that the equilibrium payoffs represented in Figure 3 apply throughout. Also note that the results do not change if we assume that the buyer moves first to announce his intention to reject the good.

It follows from Assumption 2 that $U'(e_0, p = c) = -1 < 0$ and $U'(e_0, p) \to \infty > 0$ for $p \to \infty$, where e_0 is the first-best investment decision. As $U'(e_0, p)$ is continuous in p, it follows by the intermediate value theorem that there exists a $\hat{p} \in (c, \infty)$ such that $U'(e_0, \hat{p}) = 0$. It follows from $\hat{p} > c$ and Assumption 2 that

$$U''(e, \hat{p}) \equiv -(\hat{p} - c) F_{ee}(\bar{v}\,|e) < 0. \tag{15}$$

Hence, e_0 is a global maximizer of the seller's expected payoff function $U(e, \hat{p})$. Note that assumption (12) is satisfied for $p = \hat{p}$. Also remember our claim above that we will never assume $\bar{v} < c \wedge p < c$ in order to derive our efficiency results.

ii) Now, suppose that the quality threshold is above variable cost, $\bar{v} > c$. Then, for $c < v < \bar{v}$ we know from expression (11) that the buyer will choose termination followed by restitution if:

$$v > \hat{v}(p) \equiv \frac{\bar{v} - p}{1 - \alpha} + c. \tag{16}$$

We distinguish three cases: a) $\hat{v}(p) < c$, b) $c \leq \hat{v}(p) \leq \bar{v}$ and c) $\hat{v}(p) > \bar{v}$. (see Figure 4).

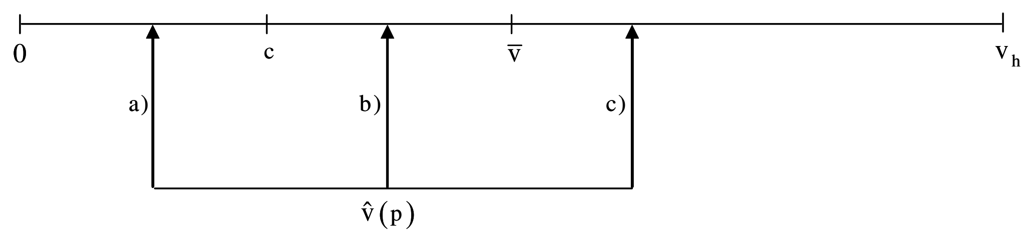

Figure 4: Termination cut-offs for different prices.

We shall now proceed in two steps. (1) First, we show for which parameter constellations the first best can be achieved by setting a price consistent with case (a). (2) Then, we will show that for all parameter constellations, for which the first best cannot be achieved under case (a), it is possible to induce the first best by setting a price consistent with case (b).

(1) Case (a) is characterized by $\hat{v}(p) < c \iff p > \bar{v}$. Hence, it follows from Lemmas 3 and 1 that the seller's expected payoff is:

$$U_a(e, p) \equiv \alpha \int_c^{\bar{v}} (v - c)\; F_v(v\,|e)\; dv + \int_{\bar{v}}^{v_h} (p - c)\; F_v(v\,|e)\; dv - e. \tag{17}$$

Integrating by parts and differentiating with respect to e gives us:

$$U_a'(e,p) = -\alpha \int_c^{\bar{v}} F_e(v|e)\ dv - 1 + [p_L - p]\, F_e(\bar{v}|e) \tag{18}$$

where $p_L \equiv \alpha\bar{v} + (1-\alpha)c$ is the lowest price for which termination can occur in equilibrium ($\hat{v}(p_L) = \bar{v}$). It follows from the first-order condition for the social optimum (2) that $U_a'(e_0, p_L) < 0$. As $U_a'(e_0,p) \to \infty$ for $p \to \infty$, and $U_a'(e_0,p)$ is continuous in p, it follows by the intermediate value theorem that there exists a $\bar{p} \in (p_L, \infty)$ such that $U_a'(e_0,\bar{p}) = 0$. It is easy to see that $U_a''(\cdot,p) < 0$ for all $\bar{p} \in (p_L,\infty)$, such that e_0 is a global maximizer of the seller's expected payoff function $U_a(e,\bar{p})$. Yet, it follows from the characterization of case (a) that $\bar{p} > \bar{v}$. Hence, if $\bar{p} \in (p_L,\ \bar{v}]$, the lowest possible price under case (a) will lead to overinvestment. (Note that $\bar{v} > c$ implies that the interval is non-empty).

(2) We will now show that for all parameter constellations for which $\bar{p} \in (p_L,\ \bar{v}]$, there exists a p' such that it is possible to induce the first best under case (b). Case (b) is characterized by:

$$p \in [p_L,\ \bar{v}] \iff \hat{v}(p) \in [\hat{v}(\bar{v}) = c,\ \hat{v}(p_L) = \bar{v}]\,. \tag{19}$$

As $p < \bar{v}$ it follows from Lemmas 3 and 1 that the seller's expected payoff can be written as:

$$\begin{aligned} U_b(e,p) \ \equiv\ & -\int_0^c (\bar{v}-p)\ F_v(v|e)\ dv + \int_c^{\hat{v}} p - c - (\bar{v}-v)\ F_v(v|e)\ dv \\ & +\alpha \int_{\hat{v}}^{\bar{v}} (v-c)\ F_v(v|e)\ dv + \int_{\bar{v}}^{v_h} (p-c)\ F_v(v|e)\ dv - e. \end{aligned} \tag{20}$$

Integrating by parts, differentiating with respect to e and inserting $e = e_0$ gives us:

$$U_b'(e_0,p) \equiv [p_L - p]\, F_e(\bar{v}|e_0) - \int_c^{\hat{v}} F_e(v|e_0)\ dv - \alpha \int_{\hat{v}}^{\bar{v}} F_e(v|e_0)\ dv - 1. \tag{21}$$

As, by definition, $U_a'(e_0,\bar{p}) = 0$, it follows from expression (18) that we can write:

$$[p_L - \bar{p}]\, F_e(\bar{v}|e_0) = \alpha \int_c^{\bar{v}} F_e(v|e_0)\ dv + 1. \tag{22}$$

This can be rewritten as:

$$[p_L - p]\, F_e(\bar{v}|e_0) = \alpha \int_c^{\bar{v}} F_e(v|e_0)\ dv + 1 - (p-\bar{p})\, F_e(\bar{v}|e_0)\,. \tag{23}$$

Inserting (23) into (21) we get:

$$U_b'(e_0, p) = -(p - \bar{p}) F_e(\bar{v} | e_0) - (1 - \alpha) \int_c^{\hat{v}} F_e(v | e_0) \ dv. \tag{24}$$

We will now show that there exists a $p^* \in [p_L, \ \bar{v}]$ such that $U_b'(e_0, p^*) = 0$. Observing that $p = p_L$ implies $\hat{v} = \bar{v}$ (see 19) and inserting into (21) gives us:

$$U_b'(e_0, p_L) = -\int_c^{\bar{v}} F_e(v | e_0) \ dv - 1 \tag{25}$$

which is *non-positive* by benchmark condition (2). Observing that $p = \bar{v}$ implies $\hat{v} = c$ (see 19) and inserting $p = \bar{v}$ into (24) gives us:

$$U_b'(e_0, p = \bar{v}) = -F_e(\bar{v} | e_0) (\bar{v} - \bar{p}) \tag{26}$$

which is *positive* as $\bar{p} \in (p_L, \bar{v})$. Then, as $U_b'(e_0, p)$ is continuous in p, it follows by the intermediate value theorem, that there must exist a $p^* \in [p_L, \bar{v})$ for which $U_b'(e_0, p^*) = 0$. The investment decision e_0 is a global maximum of the seller's expected payoff function if:

$$U_b''(e, p^*) = [p_L - p^*] F_{ee}(\bar{v} | e) - \int_c^{\hat{v}(p^*)} F_{ee}(v | e) \ dv - \alpha \int_{\hat{v}(p^*)}^{\bar{v}} F_{ee}(v | e) \ dv < 0. \tag{27}$$

As $\hat{v}(p^*) \in (c, \bar{v}]$ for all $p^* \in [p_L, \bar{v})$, the last two terms are negative. As $p^* \geq p_L$ the first term must be non-positive. Hence, the function is concave for all $p^* \in (p_L, \bar{v})$. ■

The intuition for the result is the following: (i) For low-quality thresholds, $\bar{v} \leq c$, the seller's payoff is $p - c$ if the value exceeds the threshold and 0 otherwise. Hence, the attractiveness of producing high quality increases in the price. As the seller can increase the probability of high quality by increasing investments, it is possible to use the price to adjust the seller's investment incentives to the efficient level. A similar balancing argument is behind the result for high quality thresholds, $\bar{v} > c$. However, as an additional complication, we have to take into account that the seller's payoff depends on the buyer's choice of breach remedies, which in turn depends on the contract price. If price is set above a certain threshold, the buyer will always terminate. For such prices, however, we can show that the balancing argument does not always work and overinvestment will occur for some parameter constellations. Fortunately, for these particular parameter constellations, parties can still achieve the first best by setting a lower price for which expectation damages is preferred to termination.

Finally, it is possible to make the on/off-remedy-regime degenerate into a pure 'expectation damages' regime by setting $\bar{v} \geq v_h$. We can derive the following proposition which restates the result by Stremitzer (2008b):

Proposition 2 *It is possible to induce the first best by setting a price $p < p_L$ and threshold $\bar{v} \geq v_h$ (Cadillac contract).*

Proof. Case (c) is characterized by

$$\hat{v}(p) > \bar{v} \iff p < p_L \tag{28}$$

If $\hat{v}(p) > \bar{v}$, it follows from Lemmas 3 and 1 that the seller's expected payoff can be written as:

$$\begin{aligned} U_c(e) \quad \equiv \quad & -\int_0^c (\bar{v} - p) \;\; F_v(v\,|e) \;\; dv + \int_c^{\bar{v}} p - c - (\bar{v} - v) \;\; F_v(v\,|e) \;\; dv \\ & + \int_{\bar{v}}^{v_h} (p - c) \;\; F_v(v\,|e) \;\; dv - e. \end{aligned} \tag{29}$$

Integrating by parts and differentiating, we can write the first-order condition for the seller's optimal investment decision, e_c:

$$U_c'(e_c) = -\int_c^{\bar{v}} F_e(v\,|e_c) \;\; dv - 1 = 0. \tag{30}$$

It can be seen that, by setting $\bar{v} \geq v_h$, the first best, $e_c = e_0$, is achieved in equilibrium. ■

6 Conclusion

Contractual parties who are dissatisfied with a counterparty's performance or its absence may pursue, at a most basic level, two alternative remedial routes. They can *affirm* the existing agreement and seek a remedy "on the contract" or they can *disaffirm* the agreement and go after a remedy "off the contract". Contemporary contract scholars, with some notable exceptions,[18] have focused almost exclusively on the former route, analyzing various

[18] See e.g.,Kull (1993), Basedow (2005).

efficiency properties of on-contract remedies like specific performance, expectation damages and reliance damages. The off-contract remedy of rescission and restitution has largely been ignored in the contract literature. Though academics have failed to pay adequate attention to the distinction between affirming and disaffirming a contract in pursuit of remedies, the difference is broadly recognized in common law and civil law practice and dates back to Roman law.[19] We consider the effect of allowing an aggrieved promisee to pursue either of the two basic remedial options available in practice. We demonstrate that in this more realistic remedial environment, as compared to what is typically assumed, parties are able to write simple contracts that induce first-best cooperative investments.

[19] See Kull (2006) for a thoughtful discussion of the history behind the academic blindness to the distinction in the American common law over the past century.

7 Appendix

7.1 Appendix A1: Proof of Lemma 1

In order to proof Lemma 1, which states the seller's equilibrium payoffs for the case that $v \geq \bar{v}$, we distinguish seven different cases, which cover all possible parameter constellations except for $\bar{v} < c \wedge p < c$.

(1) If $\mathbf{v > c \wedge p \geq c}$. (a) In the subgame where the seller has chosen D, the buyer accepts in equilibrium if $\Pi_B(D, A) > \Pi_B(D, \bar{A})$ which holds for $v - p \geq -(p - c) + (1 - \alpha)(v - c)$. This can be rearranged to: $v - c \geq (1 - \alpha)(v - c)$ which is true for all $v > c$.

(b) In the subgame where the seller has chosen $\bar{D}$, the buyer chooses ED if $\Pi_B(\bar{D}, ED) > \Pi_B(\bar{D}, SP)$. Given that this condition holds and using $\Pi_B(D, A) = \Pi_B(\bar{D}, SP)$ we get:

$$\Pi_S(D, A) = W - \Pi_B(D, A) = W - \Pi_B(\bar{D}, SP) > W - \Pi_B(\bar{D}, ED) = \Pi_S(\bar{D}, ED) \quad (31)$$

Hence, given that $\Pi_B(\bar{D}, ED) > \Pi_B(\bar{D}, SP)$, the seller offers delivery and the buyer accepts. The seller's equilibrium payoff will be $p - c$. If $\Pi_B(\bar{D}, ED) < \Pi_B(\bar{D}, SP)$, it is optimal for the buyer to choose SP. But then, the seller is indifferent between choosing to deliver or not, as $\Pi_S(D, A) = \Pi_S(\bar{D}, SP)$ and the payoff in equilibrium will be $p - c$. It is easy to see that the same holds true for $\Pi_B(\bar{D}, ED) = \Pi_B(\bar{D}, SP)$.

(2) If $\mathbf{v > c \wedge p < c}$. In the subgame where the seller has chosen D, the buyer accepts in equilibrium if $\Pi_B(D, A) > \Pi_B(D, \bar{A})$ which is true because $v - p > v - c \geq (1 - \alpha)(v - c)$ for all $v > c \wedge p < c$. By exactly the same argument as in part (b) of Case (1) we can conclude that the seller's payoff in equilibrium will be $p - c$.

(3) If $\mathbf{v < c \wedge p \geq c}$. In the subgame where the seller has chosen D, we can see that $\Pi_S(D, A) = p - c + \alpha(c - v) > p - c = \Pi_S(D, \bar{A})$ for all $v < c$. It follows that $\Pi_B(D, A) < \Pi_B(D, \bar{A})$. Hence, it is optimal for the buyer to reject delivery. In the subgame where the seller has chosen $\bar{D}$, we can see that $\Pi_S(\bar{D}, SP) = p - c + \alpha(c - v) > 0 = \Pi_S(\bar{D}, ED)$ as

$\bar{v} \leq v < c \leq p$. If follows that $\Pi_B\left(\bar{D}, SP\right) < \Pi_B\left(\bar{D}, ED\right)$ implying that the buyer chooses ED. As $\Pi_S\left(D, \bar{A}\right) = p - c > 0 = \Pi_S\left(\bar{D}, ED\right)$, the seller offers delivery and the buyer rejects in equilibrium. The seller's equilibrium payoff will be $p - c$.

(4) If $\mathbf{v = c \wedge p > c}$. If the seller chooses D, his payoff will be $p-c$ irrespective of what the buyer does. If the seller chooses $\bar{D}$, it is optimal for the buyer to choose ED if $\Pi_B\left(\bar{D}, ED\right) > \Pi_B\left(\bar{D}, SP\right) \iff 0 > v - p$ which is true as we assumed $v = c < p$. Yet, this implies $\Pi_S\left(\bar{D}, ED\right) < \Pi_S\left(\bar{D}, SP\right) = p - c = \Pi_S\left(D, \cdot\right)$. Hence, the seller chooses D in equilibrium and gets an equilibrium payoff of $p - c$.

(5) If $\mathbf{v = c \wedge p = c}$. If $v = c \wedge p = c$ it is easy to see that the seller's payoff will be $0 = p - c$, irrespective of what either party does.

(6) If $\mathbf{v = c \wedge p < c}$. Given that the seller has chosen D, it is optimal for the buyer to choose A if $\Pi_B\left(D, A\right) > \Pi_B\left(D, \bar{A}\right) \iff v - p > 0$ which is always true as we assumed $v = c > p$. If the seller has chosen $\bar{D}$, it is optimal for the buyer to choose SP if $\Pi_B\left(\bar{D}, SP\right) \geq \Pi_B\left(\bar{D}, ED\right) \iff v - p \geq \left[\bar{v} - p\right]^+$ which is true as $v - p > 0$ and $v - p \geq \bar{v} - p$. The seller's equilibrium payoff will therefore be $\Pi_S\left(D, A\right) = \Pi_S\left(\bar{D}, SP\right) = p - c$ irrespective of what he does.

(7) If $\mathbf{v < c \wedge p < c}$. As $v < c \wedge p < c$ implies $\bar{v} < c \wedge p < c$ for $v \geq \bar{v}$, this case is beyond the scope of the lemma and does not have to be further considered.

7.2 Appendix A2: Proof of Lemma 2.

Given that the seller has chosen $\bar{D}$, the seller will only choose SP if

$$v - p + (1 - \alpha)\left[c - v\right]^+ \geq \left[\bar{v} - p\right]^+ + (1 - \alpha)\left[v - c\right]^+. \tag{32}$$

Rearranging gives us:

$$v - p \geq \left[\bar{v} - p\right]^+ + (1 - \alpha)\left(v - c\right). \tag{33}$$

a) As $v < \bar{v}$ this will never be satisfied for $v > c$. b1) If $v \leq c \wedge p \geq \bar{v}$, the buyer will choose SP if $v - p \geq (1-\alpha)(v-c)$. Rearranging and using $v \leq c$ gives us: $p < \alpha v + (1-\alpha) c \leq c$. Yet, $p < c$ can only hold for $\bar{v} < c$. (Suppose the opposite: $\bar{v} \geq c$. Then $p \geq \bar{v}$ implies $p \geq c$ which contradicts the condition.) Therefore, SP will never be chosen by the buyer if we rule out $\bar{v} < c \wedge p < c$. b2) If $v \leq c \wedge$ $p < \bar{v}$, condition (33) can be rewritten as: $v - p > \bar{v} - p + (1-\alpha)(v-c)$. Rearranging and using $v \leq c$ gives us: $\bar{v} < \alpha v + (1-\alpha) c \leq c$. Hence, SP will never be chosen by the buyer if we rule out $\bar{v} < c \wedge p < c$.

7.3 Appendix A3: Proof of Lemma 3.

1) If $p < \bar{v}$ it can be seen that $c < \hat{v}$. a) If $v \in [0, c]$ and given that the seller has chosen D, the buyer will choose A as $v \leq c < \hat{v}$. Making use of the result of Lemma 2 that we do not have to bother about the possibility of the buyer choosing specific performance, it is then optimal for the seller to choose $\bar{D}$, whenever $\Pi_S(D, A) < \Pi_S(\bar{D}, ED)$. This is true as

$$p - c - (\bar{v} - v) + \alpha (c - v) = -(\bar{v} - p) - (1-\alpha)(c - v) < -(\bar{v} - p) \tag{34}$$

for all $v < c$. For $v = c$, he is indifferent between choosing D and $\bar{D}$. In either case, the seller's equilibrium payoff will be $-(\bar{v} - p)$. bi) If $v > c$, and given that the seller has chosen D, it is optimal for the buyer to choose A if $v \in (c,\ \hat{v}]$. Then, it is optimal for the seller to choose D, whenever $\Pi_S(D, A) > \Pi_S(\bar{D}, ED)$. This is true as

$$p - c - (\bar{v} - v) = -(\bar{v} - p) + v - c > -(\bar{v} - p) + \alpha (v - c) \tag{35}$$

for all $v > c$. bii) If $v \in (\hat{v}, \infty)$ it is optimal for the buyer to choose $\bar{A}$. The seller then chooses D, whenever $\Pi_S(D, \bar{A}) > \Pi_S(\bar{D}, ED)$ which is true for all $p < \bar{v}$. Hence, in equilibrium the seller always announces delivery and the buyer accepts for $v \in [c, \hat{v}]$ and rejects for $v \in (\hat{v}, \infty]$. The seller's equilibrium payoff will be $p - c - (\bar{v} - v)$ and $\alpha (v - c)$ respectively.

(2) If $p \geq \bar{v}$ it can be seen that $\hat{v} < c$. a) If $v \in [0, \hat{v}]$ and given that the seller has chosen D, the buyer will choose A. Using $\Pi_B(D, A) > \Pi_B(D, \bar{A})$ and observing that $p \geq \bar{v}$ and $v < c$ we can write:

$$\Pi_S(D, A) = W - \Pi_B(D, A) < W - \Pi_B(D, \bar{A}) = 0 = \Pi_S(\bar{D}, ED). \tag{36}$$

Hence, it is optimal for the seller to choose $\bar{D}$ and his equilibrium payoff will be 0. b) If $v \in (\hat{v}, c)$ and given that the seller has chosen D, the buyer will choose $\bar{A}$. Then, the seller will be indifferent between choosing D and $\bar{D}$ as $\Pi_S\left(D, \bar{A}\right) = \Pi_S\left(\bar{D}, ED\right) = 0$. The seller's equilibrium payoff will be 0. c) If $v \in [c, \infty)$ and given that the seller has chosen D, the buyer will always choose $\bar{A}$ in equilibrium. As $\Pi_S\left(D, \bar{A}\right) = \Pi_S\left(\bar{D}, ED\right)$ the seller is indifferent between choosing D and $\bar{D}$. Either way his equilibrium payoff will be $\alpha\,(v - c)$.

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