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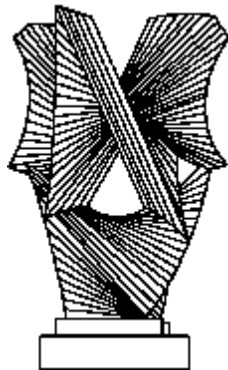
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Covenants Not to Compete from an Incomplete Contracts Perspective

Eric A. Posner¹ and George G. Triantis^{2 3}

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1 Introduction

Employment contracts frequently contain covenants not to compete (CNCs) that forbid the employee to compete against the employer or to work for a competitor. Judges and scholars demonstrate an ambivalence toward enforcing CNCs similar to their attitude toward specific performance and liquidated damages. Courts acknowledge that these remedies provide a method for holding the defendant to his promise, but are concerned that they might also unduly restrict individual freedom, impose hardship, and interfere with competition. Therefore, rather than giving remedial terms the deference that they give substantive contractual terms like price and quantity, courts adopt a case-by-case inquiry into the merits of enforcement. Specific performance is more likely to be ordered with respect to a contract for unique goods; liquidated damages are awarded when the liquidated amount is not significantly higher than the promisee's loss; and CNCs are enforced when they are limited to employment within the relevant industry and within reasonable geographic and temporal boundaries. Scholars have thoroughly explored the use and judicial limits on liquidated damages and specific performance, but have said little about CNCs. In this paper, we seek to advance an economic explanation of the use of CNCs in employment contracts, as well as the judicial constraints on their enforcement.

Drawing on Becker's (1964) distinction between specific and general human capital, Rubin and Shedd (1981) argue that a CNC is efficient when it protects the investment of an employer in general training in the absence of perfect capital markets. They imagine an industry in which the worker cannot afford to pay for the efficient amount of training, and he cannot finance this amount by borrowing from a third party because he cannot make a commitment to repay out of future income (because of bankruptcy law, laws against slavery, and so forth). Instead, the employer makes the investment and seeks to recover it over time by paying a wage lower than the worker's marginal product. However, once the worker has received the training, he has the incentive to leave for a higher wage with a competitor who will share with him the benefits from the general skills. At the time of the contract with the first employer, the worker cannot commit to refrain from leaving because he can subsequently avoid damages liability by filing for bankruptcy and because the courts are reluctant to order specific performance. In contrast, a CNC is more

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likely to be specifically enforced, even in bankruptcy court.⁴ Therefore, Rubin and Shedd conclude that the CNC is an effective alternative to specific performance. They also emphasize that this rationale applies only to general investment (that is, of value to third party employers) and therefore that the case for CNC enforcement to protect specific investment has yet to be made.

This paper addresses several questions left unresolved by Rubin and Shedd. First, we show that even in the absence of general investment, parties might rationally prefer CNCs to liquidated damages or specific performance in order to maximize ex post efficiency. Second, we show that with general investment, a CNC may be superior to specific performance. By contrast, for Rubin and Shedd, a CNC is a second best remedy that is attractive only because specific performance is not available. We explain that a CNC dominates the alternative remedies when it is conditioned on the movement of the worker only to a defined subset of alternative employers for whom the initial employer's training offers value. To highlight this point, we define an intermediate type of investment that lies between firm-specific and general training: industry-specific human capital.

Third, Rubin and Shedd do not address circumstances in which it may be ex post efficient for the worker to leave the firm in favor of another employer. We extend the analysis of investment incentives by providing that renegotiation of the CNC is permitted and costless; in this way, ex post efficiency is ensured. Thus, the firm might get its investment return in the form of a payment from the third party employer in exchange for a release of the CNC. Fourth, Rubin and Shedd do not explain why there should be any judicial interference with the parties' freedom to contract for CNCs. We show that there is a cost externality associated with specific investment that may lead sophisticated parties to contract for inefficiently broad CNCs. We suggest that the important determinant of the need to police CNCs is the parties' ability to renegotiate. The lower the cost of renegotiation, the more the parties can externalize investment costs to prospective employers. At the other end of the spectrum, if they cannot renegotiate, they cannot externalize costs and have the incentives to agree to efficient terms, including CNCs.

In Part II, we set up a stylized model of an incomplete employment contract that anticipates the subsequent entry of alternative employers. In Part III, we assume that the initial parties cannot renegotiate their contract and we investigate whether a CNC can improve performance incentives when the worker is capital constrained and judgment proof. We find that, when these constraints are binding, the CNC has mixed efficiency consequences. Compared to liquidated damages, the CNC deters inefficient breach more effectively but it also reduces the gain from efficient breach (because the CNC may preclude employment in the highest valued use). Under some conditions, the CNC has a positive net efficiency effect on trade incentives when it is not renegotiable. We also argue that a CNC might improve, but cannot worsen, investment incentives. Therefore, we conclude that the courts should enforce this term when renegotiation is impossible, subject to the usual review for unconscionability.

⁴Courts usually enforce CNCs in bankruptcy, see *In re Udell*, 18 F.3d 403 (7th Cir. 1994) (injunction based on covenant not to compete is not a "claim" for bankruptcy purposes), though they may allow the debtor to escape from a CNC that is part of an ongoing contract. An example from the franchising context is *In re Register*, 95 Bankr. 73 (Bankr. N.D. Tenn. 1989).

In Part IV, we allow for costless renegotiation of the CNC, in response to the entry of a new employer. Although renegotiation ensures efficient ex post trade outcomes, we find in our analysis of investment incentives significant support for judicial skepticism and restraint in enforcing these terms. If a prospective employer falls within the scope of the CNC, this employer and the worker must negotiate a release from the initial employer. The initial employer will only agree to a release if he is paid the worker's value to him under the initial contract. To the extent that investment increases the amount of this payment, the investment imposes a cost on the third party. Our paper is therefore related to articles suggesting that contract parties may agree to supercompensatory liquidated damages in order to deter the entry of competitors or to extract from entrants a larger portion of their surplus (Aghion and Bolton [1987], Spier and Whinston [1995], and Chung [1992]). In our case, the external cost leads to overinvestment in specific training. Spier and Whinston (1995) analyze this externality in the context of a sales contract with liquidated damages.

To illustrate, suppose that a worker (W) enters into a contract containing a CNC with an employer (E). Before the worker performs, she is approached by a new employer (Z) who values W more and offers a higher wage than E. If the CNC precludes W from working for Z and cannot be renegotiated, the social gain from breach is foregone. However, if renegotiation is costless, the ex post efficient outcome is produced and the CNC may raise the wage extracted from Z because W must also obtain release from the CNC. Ex ante, E knows that he will be compensated for his investment because the new employer will need to pay him for a release. If the investment is specific (in the sense of being worthless to any other employer), the initial employer will overinvest because he can externalize the cost of the investment to Z. This ex ante inefficiency is a plausible basis for the courts' interference with E and W's freedom to include a CNC in their employment agreement. It also suggests that the judicial inclination to enforce CNCs in cases of specific investment might appropriately depend on whether renegotiation is costly or not.

The overinvestment effect of the CNC is similar to that which would occur in anticipation of specific performance of the employment contract. Yet, a CNC differs from specific performance in a critical respect. When the CNC is the only remedy, it impedes the worker from shifting to some alternative employers (Z), but allows the worker to move to others (Y). Therefore, a CNC has two countervailing effects on specific investment in our analysis. The first is the overinvestment described in the foregoing paragraph. If the ex post efficient outcome is a shift to Z and the CNC impedes the necessary breach, the employer will be compensated for his investment even though there is no trade. This will lead him to overinvest ex ante. On the other hand, if the ex post efficient outcome is that W performs for the original employer, E, and the CNC does not deter a shift to Y, E must pay W a negotiated premium to perform. Anticipating hold-up by the worker in this event, E will underinvest ex ante. By balancing these two future effects, the choice of the scope and sanction of the CNC could yield the optimal specific investment incentives by setting the appropriate boundary between Z and Y. However, as long as they can externalize the cost of the investment in future bargaining with other employers, the parties cannot be relied on to reach this efficient result and the courts may be justified in policing their CNC decision.

While the overinvestment externality associated with specific investment militates against the injunctive enforcement of the worker's contract, there is a distinct externality related to *general* investment that operates in the opposite direction. By definition, general investments benefit all prospective employers of the trained workers. Therefore, the parties to the initial employment contract may not internalize all of the social gains from general investment, causing the employer to underinvest. Specific performance, penalty liquidated damages or CNCs can improve general investment incentives by effectively allowing the original employer to bargain with the new employer over the release of the worker from the original contract. The negotiation differs from that between new employer and worker in two important respects. First, the reservation price of original employer, E , is the value of the worker's performance; whereas, to the worker, it is the contract wage. Second, the original employer, E , may well have greater bargaining power than the worker, enabling these parties to jointly internalize a larger portion of the surplus from skills investment. They can in turn split this gain in the ex ante pricing of their initial contract.

In light of the foregoing investment incentives in the renegotiation context, courts would do well not to enforce CNCs when the training is specific and to cautiously enforce them when it is general. The superiority of CNC over specific performance or high liquidated damages is revealed when we consider that worker training is neither entirely specific nor general: usually, it is valuable to some other employers, but not all. We define this training as industry specific: specific to the industry, but general within the industry. If the scope of the CNC is defined to fit the industry in this sense, the remedy is superior to either specific performance or liquidated damages because it is conditioned on the worker's movement to an employer for whom the skills are valuable (Z , and not Y). Therefore, it sets efficient incentives by allowing the original employer to extract a larger share of the surplus from its investment from future employers who value the training, but not from those who do not. Nevertheless, because the parties externalize the efficiency costs of overly broad covenants not to compete, the courts need to police the scope of the CNC to keep them, at most, to the subset of employers for whom the relevant training is valuable.

In Part V, we test our findings against the case law concerning enforcement of CNCs. Finally, in the Conclusion, we identify several significant avenues for future research: including the effect of CNC on the search and investment strategies of the prospective employers.

2 Definitions and Assumptions

We examine a stylized interaction between a worker (W) and an employer (E). At time 0, the parties enter into a contract under which W promises to work for E at time 2 and E promises to pay to W a wage, p , if W performs. At time 1 E invests an amount, b , in training W . At time 2, as noted, E either works for W or breaches and works for someone else. At time 3, E can obtain a remedy in court if W breached.

At times 0 and 1, the value of W's work for E, v , is uncertain. Its outcome depends on the state of the world at time 2, which is a random variable θ , with cumulative distribution function $F(\theta)$ ($F'(\theta) > 0$). It is also an increasing function of E's investment, b . Thus, E's value is denoted $v(b, \theta)$ and $v_b > 0$; $v_{bb} < 0$. The investment in training may be specific or general. If the training is specific (b_s), it improves W's value in the current job only; if it is general (b_g), it raises W's value to other employers as well. To motivate our discussion of the investment efficiencies of CNCs, we introduce the assumption that W is capital constrained so that she cannot pay for this training, bond her performance or make an up-front payment to E. And, we assume that the cost of the worker's effort at time 2 is the opportunity cost of her value in alternative employment.

If W breaches at time 2, she can potentially work for two alternative employers: Z and Y. The value of W's work to each of these employers is a function of θ . The important distinguishing feature is that the value to Z is also a function of E's general investment; the value to Y is unaffected by E's investment: $z(b_g, \theta)$ and $y(\theta)$. It may be more meaningful to speak of industry-specific investment (where Z is within and Y outside E's industry), particularly because this distinction motivates the efficiency explanation for CNCs presented in section 4. We let $z(\theta_i) > v(\theta_i)$ and $z(\theta_j) < v(\theta_j)$ for some i and some j . In Section 3, we assume $z(-, \theta_i) > y(\theta_i)$ for all states of the world in order to focus on the efficiency of breach decision. In Section 4, however, breach is not an issue because costless renegotiation is permitted. Therefore, we allow for $y(\theta_j) > z(-, \theta_j)$ for some j and examine investment incentives. In our analysis, a CNC prevents W from working for a set of employers (Z) for a specified length of time, but it allows W to work for other employers (Y). This is an important distinction from specific performance or liquidated damages which establish the same impediment against W for either Z or Y.

We assume that E never breaches. If W performs for E, E pays p . If not, E seeks in court at time 3, the breach remedy provided in their contract. When the parties design the contract at time 0, they choose among four possible remedial provisions: no sanction for breach, liquidated damages, specific performance of the worker's promise to work,⁵ and injunctive relief under a CNC. Judicially calculated compensatory damages are excluded because of our information assumptions discussed below. Where the analysis allows for renegotiation of the contract, it occurs at time 2, in which case the parties perform their renegotiated obligations immediately and there is no recourse to the courts. The market for W's services is not competitive: W negotiates the initial contract with E at time 0 and the contract with Z or Y, if any, at time 2.

The information about all variables is symmetric among all parties. However, the investment, b , and the realized state of the world, θ , are not verifiable before a court. Similarly, the realized v , y , and z are not verifiable. That is why courts cannot calculate expectation or reliance damages, or enforce a perfect state contingent contract. We do assume that courts can verify whether a breach has occurred (in other words, whom W is working for), and the amount of

⁵Specific performance of a contingent contract that specifies a payment instead of performance is the same as enforcement of liquidated damages. Specific performance is, however, significantly different when the contract does not give W the option to pay money rather than work for E, in which case W cannot work at all if she refuses to work for E.

a liquidated damages provision. We discuss later whether courts are likely to be able to determine the conditions under which CNCs are socially undesirable.

As benchmarks, the following first-best conditions define optimal trade and optimal investment. Optimally, W performs his contract with E (i.e. trade will occur) if and only if

$$v > \max(z,y) \quad (1)$$

In our model, E makes the investment in W's training. If it is specific investment, the optimal investment level, b_s^* , is determined by :

$$b_s^* \in \arg \max_{\theta: v > z,y} \int v dF - b_s \quad (2)$$

The first order condition is:

$$\int_{\theta: v > z,y} v \theta_s dF = 1 \quad (3)$$

As long as there are some states of the world in which W is worth more to alternative employers than to E ($F(\theta: v > z) < 1$), the marginal yield of the last unit of investment ($v_b(b^*, \theta)$) is greater than 1 at this optimum. The reason is that the cost of investment is incurred with certainty, but the returns on the investment will occur only when the value to E is greater than the value to either of the alternative employers: $v > z,y$. Given that $v_{bb} < 0$, E should invest somewhat less than what he would invest if the parties knew with certainty that trade will be efficient.

If investment is general, the optimal trade condition remains the same as above, but the investment condition changes to:

$$b_g^* \in \arg \max_{\theta} \int_{\theta: v > z,y} v dF + \int_{\theta: z > v,y} z dF - b_g \quad (4)$$

and the first-order condition to:

$$\int_{\theta: v > z,y} v \theta_g dF + \int_{\theta: z > v,y} z \theta_g dF = 1 \quad (5)$$

In the case of general investment, therefore, the optimum investment is such that the expected marginal gains from investment in either job must add up to 1. Social welfare is maximized if E invests as if he obtained the return when W works for Z as well as when W works for E (but not when W works for Y). Thus, as in the specific investment case, the marginal yield of the last unit of investment to E is greater than 1.

3 No Renegotiation

A standard finding in the economics of incomplete contracting is that efficient trade and efficient investment are in tension. If trading partners are not bound to perform, they will trade if and only if trade is efficient under the first-best criterion. However, the parties will share the gains from trade according to their respective bargaining power. E will anticipate that he will not retain the full surplus from investment and will therefore invest less than the first-best amount. This is referred to as the hold-up problem. (Williamson [1975]). Moreover, E will capture a small part, if any, of the gain from general investment that is yielded when W works for another employer. Therefore, without a commitment, E is likely to underinvest in both specific and general training.

If W makes a contractual commitment that cannot be renegotiated, E will capture the entire marginal social return on his specific investment and therefore will have efficient specific investment incentives. However, given that the parties cannot renegotiate and cannot condition their trade ex ante on the outcome of θ , v or z (which are by assumption not verifiable), trade will occur even when inefficient. Although the literature has suggested several contract terms that might achieve both efficient trade and efficient investment, they are available under restrictive information and enforcement assumptions that fall outside our model.⁶

A CNC is a negative covenant: a promise to refrain from working for a defined set of employers.⁷ Like liquidated damages, the scope of a CNC is a critical decision variable that does not rely on the verifiability of the realized values of v , z , or y . Unlike liquidated damages, however, W cannot avoid its enforcement through bankruptcy. This suggests that the CNC may be more effective than damages in deterring breach and inducing performance. On the other hand, if W quits in the face of a CNC, she will work for Y rather than Z. This creates a deadweight opportunity loss of $(z - y)$ that is not incurred under liquidated damages. The net efficiency comparison is far from clear.

In our model, the scope of the CNC determines the distinction between Z and Y. We assume for the purpose of exposition that $z > y$ in all states of the world.⁸ The broader the CNC, the smaller the set of firms “in Y” and the larger the set of firms “in Z”, thereby yielding a larger difference, $z - y$. One might think of specific performance as being the limiting case in which $y = 0$. The parties will strive to maximize their joint welfare in their determination of the CNC’s scope; the courts will police this line in order to maximize social welfare. In this section, we argue

⁶See, e.g., Edlin 1996; Hermalin & Katz 1993; Nöldeke & Schmidt 1995; Edlin & Reichelstein 1996.

⁷A CNC typically prohibits W from working for Z not only at time 2, but also during subsequent periods. If we denote the duration of the CNC (including time 2) by t , the cost of the breach sanction on W is $k = t(z - y)$. If this prohibition applies irrespective of W’s breach, then it has no effect on W’s decision to work at time 2 or on E’s investment decision at time 1. It may be more relevant to the protection of trade secrets, as discussed in Section 5.

⁸This assumption should not affect the applicability of the results concerning the breach decision. If $y > z$ for some state of the world, then the CNC has no effect on breach decisions in that range. The analysis therefore applies to those states of the world in which $z > y$.

that the parties will tend to have incentives that coincide with social efficiency when the CNC cannot be renegotiated. The next section examines cases in which CNCs can be renegotiated.

With a simple model, we can begin to compare the effect of adding a CNC in a contract enforced by damages, where the worker is capital constrained and judgment proof. If the values of v , z , and y are not verifiable, the parties might agree to liquidated damages that are likely to be constant. Let the amount of those damages be d . Under this regime, W breaches when $z > p + d$ (recall that z is assumed in this section to be always greater than y) and performs otherwise. We use $\beta = p + d$ to define the aggregate sanction for breaching: the loss of the wage from E plus the damages liability.⁹ Given the distribution of v and z , the parties would choose the β that optimizes W 's breach incentives. In any given case, let the optimum be β^* .

If, however, W has limited wealth and cannot borrow, this places a cap on the values that β can assume. Let this cap be β^\wedge . If the constraint is binding, $\beta^* > \beta^\wedge$. This may occur, for example, because the collectable portion of damages are insufficient to deter inefficient breach or the wage (p) cannot be set sufficiently high to induce the worker to perform because the worker cannot borrow the amount necessary for an up-front payment. In these cases, it is plausible that the introduction of a CNC may improve the efficiency of trade. The CNC prevents W from working for Z and shifts the breach condition to $y > \beta$, instead of $z > \beta$. Since we assume that $z > y$, the CNC reduces the incidence of breach. This yields a gain to the extent that breach is inefficient (θ_i , where $v(\theta_i) > z(\theta_i)$) and a loss where breach is efficient (where $v(\theta_i) < z(\theta_i)$). When W does breach and is bound by the CNC, she works for Y rather than Z (where $z > y > v$). This produces a loss of $(z - y)$.

Figure 1 illustrates the trade-off. We arrange θ_i along the horizontal axis, such that v is monotonic. We assume that $v(\theta)$ is linear and that $z(\theta)$ and $y(\theta)$ are also linear.¹⁰ The parties' selection of price and damages (adjusted for W 's wealth and borrowing capacity) and their decision to include a CNC, interact with the functions v , z and y to produce three regions. First, where $\beta^\wedge > z$ (i.e. from $\underline{\theta}$ to θ'), the CNC does not affect the outcome: the worker performs and v is realized. Second, where $z > \beta^\wedge > y$ (i.e. from θ' to θ''), the CNC induces W to perform while the simple liquidated damages regime results in breach and employment with Z . The net benefit from CNC in this region depends on the parameters of the functions v , z and y . Third, where $\beta^\wedge < y$ (i.e. from θ'' to θ^\wedge), the CNC is clearly inferior to simple liquidated damages because W must work for Y rather than Z . Therefore, the desirability of a CNC depends on the net magnitude of efficient breach in the second region and the size of the offsetting deadweight loss in region 3.

[Figure 1]

⁹Alternatively, W might make an advance payment to E at the time of the contract, in which case d represents this forfeitable deposit.

¹⁰From our assumption that $E(v) > E(z) > E(y)$, the slope of v must be steeper than the slope of z , and so forth. To allow v to cross z and y , v 's slope must have the opposite sign from z 's and y 's.

Examination of the graph, and simple mathematics,¹¹ reveals that it is possible for the CNC to be superior to liquidated damages. The CNC produces “too much” performance and too little breach; capital constrained liquidated damages has the opposite effect. For an arbitrarily high v , too much performance produces more value than too much breach. The CNC can also be superior to simple specific performance of the contract, in which case y is effectively 0.¹²

Although this is not the focus of the paper, we observe in passing that the comparative statics are fairly complex, aside from the simple result that the value of the CNC increases with v . By way of example, increasing z has two effects. First, it reduces the marginal improvement of the CNC over liquidated damages when performance is efficient (the excess of v over z declines); it increases the loss when the CNC compels inefficient performance (the excess of z over v increases); and it increases the loss when the CNC permits W to work for Y (the excess of z over y increases). In these respects, increasing z reduces the value of the CNC. Second, increasing z makes breach more attractive under liquidated damages but not under a CNC, and this is at the margin where v exceeds z by the greatest amount (z shifts θ' to θ'' to the left). In this respect, increasing z enhances the value of the CNC. Comparative statics¹³ shows that the value of the CNC increases with z when z is low, but declines with z when z is high. The same is true for β ; the opposite is true for y . The basic reason is that the variables work at two margins, affecting the amount of value lost (or gained) as a result of breach, and the incidence of breach. But we are more interested in establishing that parties will rationally and efficiently use CNCs to improve breach incentives when the liquidated damages remedy is undermined by the risk that W is judgment proof or unable to make an up-front payment, and that is the point that the reader should take from the discussion.

From the perspective of social welfare, CNCs do not have the problems that authors have pinned on liquidated damages. E and W have an incentive to choose high liquidated damages in order to extract value from employers (Z and Y) who will attempt to bid for W 's services. (Aghion & Bolton [1987] and Chung [1992]). Z or Y pay the liquidated damages to E , who splits them with W ex ante; this compensates E and W for losses that result from inefficient performance but there is still a social cost. In the case of the CNC, there is no such payment; while there is a deadweight loss if breach occurs, it is internalized by E and W . Thus, E and W cannot use the CNC to extract value from third parties. Therefore, when renegotiation is impossible and investment is specific, courts should be less hostile to CNCs than to liquidated damages provisions (though, by the same token, they should be less reluctant to order specific performance of the contract if the parties so desire).

We should note that under the assumption of no renegotiation in this subsection, the investment decision is a redundant issue, and thus the issue of investment efficiency does not arise. W cannot hold up E on account of the latter's investment and therefore E does not

¹¹Available from the authors.

¹²The parties could design the initial contract so that W has the right to work for Y , and then count on specific performance; that is effectively the same thing as a CNC.

¹³Available from the authors.

underinvest. At the same time, if W moves to work for Y, E is not compensated and therefore will not overinvest in specific training. E will underinvest in general training that would have increased the value of W to Y. However, the CNC is no worse with respect to this problem than the other remedies.

4 Renegotiation

Under the assumption of costless renegotiation, the parties will reach the ex post efficient outcome regardless of the contract remedy. That is, W will work for E if and only if the value of W to E is greater than in alternative employment. Renegotiation, however, has a significant effect on ex ante investment incentives. If E has no contract remedy, W will be able to hold up E for the amount of its investment by threatening to leave when $v > z$, y . In anticipation of the hold up, E will underinvest. If, instead, W contracts to work for E and if E can enforce this promise to prevent W from breaching, W must negotiate for E's consent to work for Z or Y. The requirement of E's consent has two effects on investment incentives – one efficient and the other not. First, if W leaves, she must work for the lower wage y , rather than z . The fact that W cannot unilaterally move to Z reduces W's threat of breach and, correspondingly, her hold-up opportunity. In turn, this mitigates E's underinvestment incentive. Second, in cases where $z > v$, the enforcement of W's promise allows E to recover the payoff on his investment even when W works for another employer. If the investment is specific, it has no social payoff in that event. Thus, there is an overinvestment externality with respect to specific investment. If, however, the investment is general and enhances the value of W to the new employer, the release payment helps E internalize a greater portion of the social benefit from the investment. The magnitude of these effects depends on the manner in which the parties choose to enforce their contracts (liquidated damages, specific performance, CNC, etc.) In examining the effect of renegotiation on investment incentives, we assume that E and W can successfully structure their own contract at time 0 and renegotiation at time 2 in such a manner as to avoid hold-ups and maximize their joint private welfare.

To specify the renegotiation somewhat, if W is not bound to work for E, he may bargain with Z at time 2 and receive a wage of $(1 - \gamma)p + \gamma z$, where $\gamma \in [0,1]$ represents W's bargaining power vis-a vis Z. (For example, with probability of γ , W can make a take-it-or-leave-it offer.) As noted earlier, this bargain has no effect on E's investment incentives. If, however, E can block W from moving to Z, E effectively becomes a party to the new bargain and must consent to the split. Two important implications follow. First, E must receive at least v in order to consent. Therefore, when E and W negotiate together against Z, they will demand at least a wage of v . Second, E may have greater bargaining power than W alone because, for example, E may have lower risk aversion or discount rate. With E, the parties may be able to capture a larger part of the surplus, δ , than W would alone ($\delta > \gamma$). Therefore, W would receive from Z a wage of $(1 - \delta)v + \delta z$. E and W can split this amount ex ante in their initial contract. We assume later in the section, for simplicity, that the same parameters would apply in negotiations with Y in place of Z, and the wage received by W would be $(1 - \gamma)p + \gamma y$ if movement to Y is not restricted in the initial contract, and $(1 - \delta)v + \delta y$ otherwise. We assume in this section that, for some θ , $y > z$. The remainder of this section examines the effect of renegotiation on E's investment incentives and

explains why the courts should police the use and scope of CNCs when the parties can renegotiate the term at low cost.

4.1 Specific Investment

If W is bound to work for E (e.g., by specific performance or very high liquidated damages) and we assume costless renegotiation, then efficient trade will occur. W will perform for E when $v > z, y$, and will work for Z or Y after negotiating any necessary release from E when $v < z, y$. Recall that the E and W will share a payment from Z (or Y) of $(1 - \delta)v + \delta z$ (or $(1 - \delta)v + \delta y$). Therefore, their private investment incentive is:

$$b_s^* \in \arg \max \int_{\theta: v > z, y} v dF + \int_{\theta: z > v, y} [(1 - \delta)v + \delta z] dF + \int_{\theta: y > v, z} [(1 - \delta)v + \delta y] dF - b_s \quad (6)$$

The first order condition is:

$$\int_{\theta: v > z, y} v_b dF + (1 - \delta) \left[\int_{\theta: z > v, y} v_b dF + \int_{\theta: y > v, z} v_b dF \right] = 1 \quad (7)$$

The payment to obtain E 's consent causes overinvestment in specific training because it guarantees E at least some of her return on investment even if W works for Z or Y . This overinvestment is unavoidable if their contract is enforced by specific performance or high liquidated damages.

As an aside, we note that a CNC offers an analytically intriguing solution if we relax for the moment the assumption that E and W act as one. Recall that if W is not bound, W may extract the quasi-rents of E 's specific investment. Therefore, the parties can establish efficient investment incentives by choosing contract terms that balance these two effects: (i) the inadequate return E obtains when performance is optimal and W has the ability to hold-up and (ii) the excess return E obtains when non-performance is optimal and W is bound by his contract.¹⁴ Specifically, recall that a CNC defines the boundary between prohibited and permitted alternative employers: in our model, Z and Y , respectively. An appropriately designed CNC can set the boundary between Z and Y to balance the likelihood that E will have to pay W to perform and that W will pay E to release the CNC. If $v > y > p$, the parties must bargain to avoid inefficient movement by W to Y . In this bargaining, E will be held up with respect to its specific investment. If $p > z > v$, W must negotiate the release from its CNC in order to move to Z , and will pay E the value of its specific investment. Because the specific investment cannot be used by z , this will cause overinvestment

¹⁴Edlin and Reichelstein (1996) make a similar proposal in the context of a sale of goods contract. In their article, the quantity term is set in order to balance the tendencies for under- and overinvestment. In our analysis, the CNC is the term used to achieve a similar balance.

ex ante. Therefore, the parties could in theory create the optimal investment incentives by setting the boundary between Z and Y to balance the expected impact of the countervailing effects on investment.

However, the parties lack the motivation to achieve this optimal balance. As Spier and Whinston (1995) argue in an analysis of sales contracts with liquidated damages, parties will choose an inefficiently strict remedy in order to externalize the costs of overinvestment on third parties. Similarly, parties will make their CNC inefficiently broad – to the point of being functionally equivalent to specific performance – in order to externalize investment and, if $v > p$ and $\delta > \gamma$, to extract a larger portion of the surplus created when the worker shifts her employment to Z from E. Therefore, their use of CNC is likely to lead to overinvestment by E in specific training and should (like liquidated damages) be policed by the court.

4.2 General (Industry-Specific) Investments

E's investment is general when it raises W's value to Z, as well as to E. The distinctive concern with general investment is that, in the absence of an impediment to W's employment elsewhere, E will fail to account fully for the benefit from her investment that is enjoyed by alternative employers when W chooses to work for them. As noted above, without a prohibition against working for Z, W will negotiate a wage of $(1 - \gamma)p + \gamma z$ with Z and $(1 - \gamma)p + \gamma y$ with Y. Therefore, the parties' private objective is to choose b such that

$$b_E^* \in \arg \max \int_{\theta: y > z, y} v dF + \int_{\theta: x > v, y} [(1 - \gamma)p + \gamma z] dF + \int_{\theta: y > v, z} [(1 - \gamma)p + \gamma y] dF - b_E \quad (8)$$

The first order condition is (recall that E's investment only affects the values of v and z):

$$\int_{\theta: y > z, y} v \partial_x + \gamma \int_{\theta: x > v, y} z \partial_x = 1 \quad (9)$$

This private optimum can be compared to the social optimum in equation (5) to reveal that E will underinvest because the parties only capture a fraction γ of the marginal benefit to Z from the investment.¹⁵ The severity of the underinvestment varies inversely with γ , W's bargaining power in dealing with Z. If W is a monopolist with unique skills that are of similar value to a large number of potential employers, then she may be able to extract the full surplus (on behalf of W and E, jointly). In these cases, the justification for CNC presented in this Section does not apply. Where $0 < \gamma < 1$, however, the parties will strive to structure their contract so as to capture a larger portion of the surplus and push investment incentives toward the social optimum, or beyond.

¹⁵It may also be the case that Z has made investments in anticipation of W's arrival and the rents therefrom may be appropriated by W (and E). Although, this may cause Z to underinvest, it does not improve E's investment incentives, which are independent of this potential windfall.

W and E may be able to increase their share of the return from investment by choosing terms that restrict W's freedom to work for Z. Suppose that the initial contract provided for specific performance or high liquidated damages – defined as $d > \sup[z(\theta, b)]$ – that must be renegotiated if W is to work for Z or Y. Suppose also that the courts would enforce either the specific performance or high liquidated damages remedy. We will refer to them collectively as specific performance because they have the same effect in compelling renegotiation of the initial contract. E becomes a party to the negotiations over W's wage from other employers. As noted earlier, this has two consequences. First, the minimum wage become the maximum of p or v . Second, the division of the surplus is determined by the greater of the bargaining powers of E or W. Suppose that $v > p$ and $\delta > \gamma$. The wages received from Z and Y are $(1 - \delta)v + \delta z$ and $(1 - \delta)v + \delta y$, respectively. Then, E and W will set contract terms so as to achieve the following investment condition:

$$b_E^* \in \arg \max \int_{\theta: y > z, y} v dF + \int_{\theta: z > v, y} [(1 - \delta)v + \delta z] dF + \int_{\theta: y > v, z} [(1 - \delta)v + \delta y] dF - b_E \quad (10)$$

The first order condition is:

$$\int_{\theta: y > z, y} v \delta_n dF + \delta \int_{\theta: z > v, y} z \delta_n dF + (1 - \delta) \left[\int_{\theta: z > v, y} v \delta_n dF + \int_{\theta: y > v, z} v \delta_n dF \right] = 1 \quad (11)$$

Specific performance improves general investment incentives by allowing E to internalize a larger portion of the social gains from general investment. However, E is also compensated for some of the return on the investment on v even in those states where W works for Z or Y. This is an overinvestment externality. If we compare (11) against the social optimum condition in (5), we arrive at the following condition under which specific performance yields the optimal incentives.

$$\int_{\theta: z > v, y, y > v, z} v \delta_n dF = \int_{\theta: z > v, y} z \delta_n dF \quad (12)$$

(provided that $\delta < 1$). The right side of the equation is the expected marginal value of the training to Z in those states of the world in which it is efficient for W to work for Z. The left side represents the expected marginal distributional gain from investment to E in those states in which it receives a payout from an alternative employer. Recall that in those states, the gain to v from investment is lost. Where the latter distributional gain is precisely equal to the social gain from investment to z , optimal investment is achieved. The satisfaction of this condition is exogenous to the parties' agreement. Therefore, specific performance either falls short of correcting the underinvestment problem (where the right side exceeds the left in (12)) or overshoots and causes an overinvestment problem (the right side is less than the left).

Covenants not to compete are usually limited in scope. To the extent that these limitations define the range of alternative employment opportunities in which the general skills are valuable (e.g. the industry to which the investment is specific), a covenant not to compete may be superior to liquidated damages and specific performance. Specifically, if the parties agree to a CNC that impedes W's movement to Z, but not Y, E will invest as follows:

$$b_E^* \in \arg \max \int_{\theta: Y > Z, Y} v dF + \int_{\theta: Z > Y, Y} [(1 - \delta)v + \delta E] dF + \int_{\theta: Y > Y, Z} [(1 - \gamma)p + \gamma y] dF - b_E \quad (13)$$

The first order condition is:

$$\int_{\theta: Y > Z, Y} v \partial_r dF + (1 - \delta) \int_{\theta: Z > Y, Y} v \partial_r dF + \delta \int_{\theta: Z > Y, Y} z \partial_r dF = 1 \quad (14)$$

By comparing (14) with the social optimum investment condition in (5), we arrive at the following condition for optimal investment incentives under the covenant not to compete.

$$\int_{\theta: Z > Y, Y} v \partial_r dF = \int_{\theta: Z > Y, Y} z \partial_r dF \quad (15)$$

Compare this optimality condition with the corresponding condition for specific performance in (12). The left hand side in (15) is by definition less than the right hand side in (12). This makes it less likely that the left side exceeds the right and makes overinvestment a less severe risk. The intuition here is that the covenant not to compete does not allow the parties to extract value from Y and thereby externalize to Y the cost of worker training.

The efficiency of CNCs depends on the parties choosing the optimal defined CNC, or the courts compelling them to do so. The tendency of the parties will, of course, be to expand their CNC to externalize the cost of worker training to as many prospective future employers as possible: that is to come as close as possible on the effect of specific performance demonstrated above. This explains the need for the courts to trim the scope of CNCs to those employers for which the investment is valuable (Z). In many cases, that subset lies within the industry and it may be consequently more apt to refer to E's investment as industry-specific, rather than general investment. Further, E will want to define the duration and geographic scope to be greater than necessary to recover its return, which we do not capture in the model. Courts must be able to prevent this as well.

To summarize, a CNC has a significant external impact because it introduces the original employer, E, to the negotiations between W and its new employer. Where the CNC is binding, it permits the initial parties to recover some of the gains from the general investment to Z, and therefore mitigates the incentive of E to underinvest. However, it also permits the parties to recover the marginal contribution of the investment to v in those states where W will work for

employers for whom the training is not valuable. This leans E's incentives toward overinvestment. Even in the case of general (or industry-specific investment), the latter effect might outweigh the former. Because the parties externalize the efficiency losses from overinvestment, they lack the incentive to agree to the optimal CNC scope in their initial contract. They will tend to agree to overly broad covenants. This analysis explains: first, why CNCs may be better at yielding efficient investment incentives than specific performance or very high liquidated damages and, second, why the courts should police the scope of CNCs and restrict them, at least, to those employers for whom the relevant training is valuable.

4 Trade Secrets

We have defined specific investment to improve the value of W to E and general investment to increase the value of W to E *and other employers (Z)*. By trade secrets, we mean even more general investments that raise the value of W *and other employees* to E and other employers (z) at time 2.¹⁶ These are sometimes referred to as disembodied trade secrets. Customer lists, production techniques and internal organizational structures are examples. In both the cases of general investments and trade secrets that are enjoyed by Z, E may not internalize the full social benefit of her investment. Moreover, E may be injured by the competitive advantage thereby gained by the other employer. The critical difference between general investments and trade secrets is that W need not change employment in order to pass the benefits of trade secrets to other employers. Therefore, a severe sanction on quitting may not be sufficient to deter her sale of E's trade secrets, and the natural legal response is to make the seller of trade secrets criminally liable.

Yet a CNC may still be instrumental in addressing the risk of appropriation of trade secrets by W. If, at time 0, W promises not to pass on E's trade secrets, the enforcement of this contract (or criminal prosecution) is hampered by significant verifiability obstacles. It is difficult for E to prove at time 3, for example, that the customer list used by Z was E's list, given to Z by W. Those facts, however, may be observable to E. Therefore, W's promise is more readily enforceable through E's internal disciplinary process (e.g. demotion, suspension, etc.), particularly if E's incentive to act capriciously or to use his powers to revise W's contract can be controlled by reputation. To the extent that W can leave E's employment with the trade secrets, she can escape these sanctions. Conversely, if she is compelled to continue working for E, she will thereby be deterred from appropriating trade secrets. To the extent that W's quitting cannot be prevented by the usual contract remedies of specific performance or damages (for the reasons indicated earlier in the paper), the CNC enhances the effectiveness of internal discipline by raising the cost of exit. This reasoning does not justify why CNCs are to be preferred over specific performance. Nor does it explain why CNCs are sometimes not contingent on the worker's breach: they apply whether she quits, performs, or even is terminated. In this context, the CNC may not track and, indeed, may even exceed the set of those industries in which trade secrets are valuable. Its optimal scope and duration are a function of the value of the trade secrets to the firm, the observability and the

¹⁶Rubin & Shedd (1981) do not appear to make this distinction.

verifiability of disclosures by the worker to competitors, the reputation and other constraints on opportunistic use of internal sanctions by the employer, and the cost of renegotiation.

5 Doctrine

Our model is premised on several restrictive assumptions and we are therefore cautious in making any descriptive or normative claims. With that caveat, we might compare our conclusions with the common law doctrine. In brief, our analysis suggests that a court faced with a CNC should ask itself three questions. First, to what extent were the parties able to renegotiate their covenant? If renegotiation is impossible or very costly, the courts should enforce the CNC. Otherwise, they should address the second question: did the covenant protect employer investment in specific or in more general training? If renegotiation is possible and the CNC clearly protects only specific investment, the courts should not enforce the CNC. If the investment might benefit alternative employers (i.e. general), it might correct underinvestment incentives and the court should therefore proceed to the third question: would the covenant enable the parties to externalize training costs to prospective employers who are unlikely to benefit from the related skills? If so, the courts should appropriately curtail the reach of the CNC. The protection of trade secrets involve a distinct inquiry along the lines described in Section 4, leading the courts to enforce the CNC subject to limits preventing overreaching. In this section, we briefly review the manner in which the courts address the three questions posed above. We concede, as a preliminary manner, that these questions may well depend on factors that are themselves very difficult for the courts to verify.

We are unaware of cases in which enforcement of a CNC turns on whether renegotiation is impossible or costly or easy. This might be because renegotiation is never very costly, in which case the assumption of impossible renegotiation is no more than a modeling artifact, or because courts cannot distinguish between employment relationships which are difficult to renegotiate and employment relationships which are easy to renegotiate. We think it most plausible that renegotiation is relatively cheap in ordinary employment relationships, and therefore the assumption of costless renegotiation is more appropriate than the assumption of impossible renegotiation.

Given that renegotiation is possible, the courts must investigate whether the CNC protects specific or more general training; they should enforce (with limits) a CNC only in the latter case. The doctrine, of course, does not speak in these terms. Rather, it holds that a CNC can be enforced only in employment contracts involving a “protectible interest” that would be lost if the employee were hired by a competitor. Although there is no general definition of a protectible interest, it is conventionally thought to include long-term customer relationships, good will, confidential information, trade secrets, customer lists, and extraordinary skills.¹⁷ These categories reflect an

¹⁷See Decker (1985), pp. 75-78.

overwhelming concern with general investments or trade secrets, as opposed to specific skills.¹⁸ For instance, a court enforced a CNC in a case involving a hearing aid salesman who had obtained a license to sell hearing aids as a result of the employer's investment in training.¹⁹ This license and training could readily be deployed in competition with the employer. Similarly, if an employer improved the employee's ability to foster good relations with customers, the employee might take that ability, not to mention the customers, to another firm.

However, there are cases in which courts fail to find a protectible interest even though the employer appears to have made a general investment, for example, the training of a copy machine repairman, a hairdresser, and even a vice president of a company.²⁰ This undermines somewhat the match between the general/specific investment distinction and protectible/ non-protectible interests. The category of protectible interest appears underinclusive.

If a court finds a protectible interest, it turns to policing the reach of the CNC. According to the doctrine, the court will enforce a CNC only if there is a reasonable relationship between the protection of that interest and the duration and scope of the covenant. Our analysis begs the question of whether the judicial limits to CNC enforcement roughly track our concern with overinvestment externalities (the third question). While the results of the cases indicate a judicial appreciation of the incentives of employers and workers to agree to inefficiently broad and long-term covenants, we find only weak links to investment incentives. Geographic restrictions seem to prevent employers from extracting quasi-rents from other employers who would not benefit from the workers' expertise because it is local. Time restrictions prevent employers from extracting quasi-rents from other employers who would not benefit from the workers' expertise that is time-sensitive. Yet, even along these dimensions, the courts rely largely on rules of thumb. In general, covenants appear most likely to be enforced if their time limits are two years or less, their geographical restrictions are fewer than 34 miles, and activity restrictions are narrow.²¹ Very long or unlimited time periods, and very broad or unlimited geographical areas, are rarely upheld. Other restrictions seem somewhat more haphazard. For example, if an employee has managed ten of the employer's 100 clients, a covenant that prevents the employee from competing for those ten clients is more likely to be upheld than a covenant that prevents the employee from competing for all 100 clients.²² If the employee is a disk jockey for a radio station that broadcasts over 60–90 miles, then a 100 mile covenant reasonably limits the ability of a competitor to broadcast the disk

¹⁸The only problem for our argument is the extraordinary skill category – an extraordinary skill should be considered a protectible interest under our model only if the skill is the result of the employer's general investment, rather than something brought to the relationship by the employee – but this category appears in any event to be nearly empty. See Decker (1985), pp. 82-84.

¹⁹Levy v. Baker, 528 S.W.2d 558 (Tenn. Ct. App. 1973). See also Tigor Title Insurance Co. v. Cohen, 173 F.3d 63 (2d Cir. 1999) (title insurance salesman, a senior vice president in charge of several major accounts, had unique skills).

²⁰Decker (1985), pp. 82-83, citing Greenlee v. Tuscaloosa Office Prods. & Supply, Inc. 474 So.2d 669 (AL 1985); Family Affair Haircutters, Inc. v. Detling, 488 N.Y.S.2d 205 (1985), and Reed, Roberts Assocs., Inc. v. Strauman, 386 N.Y.S.2d 677 (1976).

²¹Whitmore 1990.

²²See Eichmann v. National Hospital and Health Care Services, 719 N.E.2d 1141 (App. Ill. 1st Dist. 1999).

jockey's program into the first employer's broadcast area.²³ In a case involving a highly paid sales executive in a high-tech business, however, an unlimited geographic area was enforced.²⁴

Finally, courts appear to be willing to enforce more expansive CNCs in order to protect trade secrets, than in other contexts.²⁵ However, as before there is a tradeoff between this benefit of the CNC and the various harms – including the overinvestment externality – and there is the danger that the employer will give the worker confidential but unnecessary information in order to justify enforcement of a CNC that would otherwise be illegitimate.

6 Conclusion

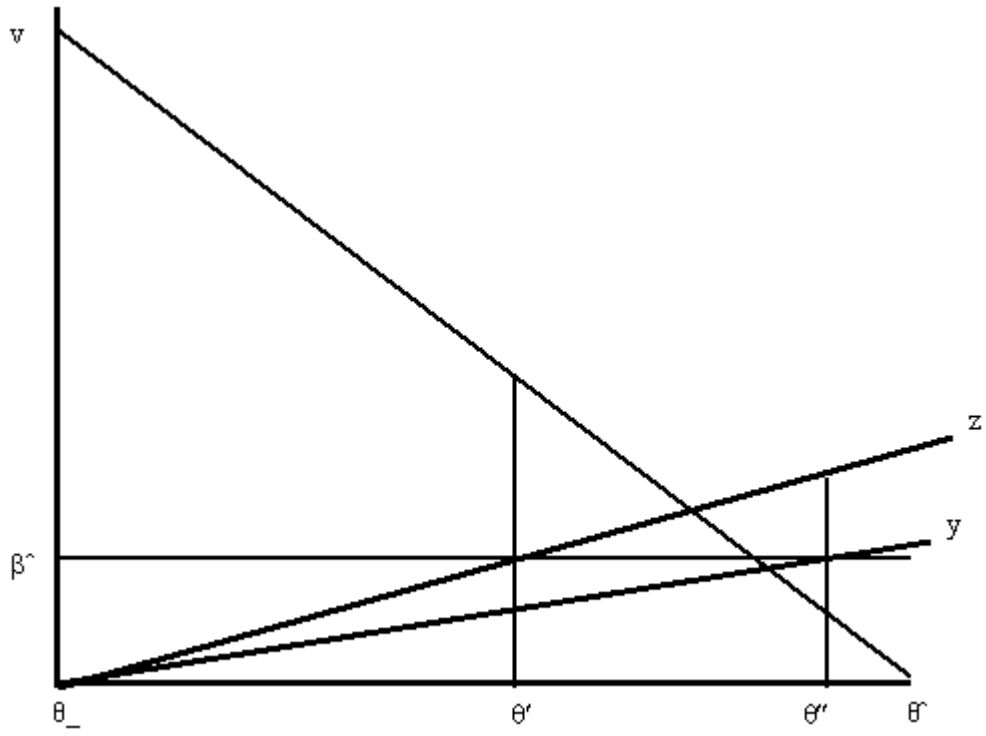
Our exploration of the CNC has shown that if courts can determine when renegotiation is costly, they should enforce CNCs, and they should enforce them more liberally than liquidated damages provisions. When renegotiation is cheap, our conclusion is more complex. The attraction of the CNC is that, unlike specific performance, it can potentially be used to balance out over- and underinvestment incentives when the employer makes a general investment. But the parties do not have the right incentives to choose the socially optimal CNC, just as they do not have the right incentives to choose the socially optimal liquidated damages clause.

²³Midwest Television v. Oloffson, 699 N.E.2d 230 (App. Ill. 3rd Dist. 1998).

²⁴See CIENA Corporation v. Jarrard, 203 F.3d 312 (2000).

²⁵Decker (1985), pp. 84-86.

Figure 1



References

- Aghion, Philippe, and Patrick Bolton. 1987. "Contracts as a Barrier to Entry," 77 *American Economic Review* 388-401.
- Aghion, Philippe, Matthias Dewatripont, and Patrick Rey. 1994. "Renegotiation Design with Unverifiable Information," 62 *Econometrica* 257-82 (1994).
- Che, Yeon-Koo, and Donald B. Hausch. 1999. "Cooperative Investments and the Value of Contracting," 89 *American Economic Review* 125-47.
- Chung, Tai-Yeong. 1992. "On the Social Optimality of Liquidated Damages Clauses: An Economic Analysis," 8 *Journal of Law, Economics, and Organization* 280-305.
- Decker, Kurt H. 1985. *Covenants not to Compete*, vol. 1 (2d ed.).
- Edlin, Aaron S. 1996. "Cadillac Contracts and Up-front Payments: Efficient Investment Under Expectation Damages," 12 *Journal of Law, Economics, and Organization* 98-118.
- Edlin, Aaron S, and Stefan Reichelstein. 1996. "Holdups, Standard Breach Remedies, and Optimal Investment," 86 *American Economic Review* 478-501.
- Gilson, Ronald J. 1997. "The Legal Infrastructure of High Technology Industrial District: Silicon Valley, Route 128 and Covenant Not to Compete," Columbia University School of Law/Sloan Foundation Project on Corporate Governance Working Paper.
- Hart, Oliver D., and John Moore. 1988. "Incomplete Contracts and Renegotiation," 56 *Econometrica* 755-85.
- Hermalin, Benjamin E., and Michael L. Katz. 1993. "Judicial Modification of Contracts between Sophisticated Parties: A More Complete View of Incomplete Contracts and their Breach," 9 *Journal of Law, Economics, and Organization* 230-55.
- Nöldeke, Georg, and Schmidt, Klaus M. 1995. "Option Contracts and Renegotiation: A Solution to the Hold-Up Problem," 26 *RAND Journal of Economics* 163-79.
- Rea, Samuel A., Jr. 1984. "Arm-Breaking, Consumer Credit and Personal Bankruptcy," 22 *Economic Inquiry* 188-208.
- Rogerson, William P. 1984. "Efficient Reliance and Damage Measures for Breach of Contract," 15 *RAND Journal of Economics* 39-53.
- Rubin, Paul H, and Peter Shedd. 1981. "Human Capital and Covenants Not to Compete," 10 *Journal of Legal Studies* 93-110.
- Schwartz, Alan, and Joel Watson. 2000. "Economic and Legal Aspects of Costly Recontracting," Working Paper #242, Yale Law School Program for Studies in Law, Economics, and Public Policy.
- Shavell, Steven. 1980. "Damage Measures for Breach of Contract," 11 *Bell Journal of Economics* 466-90.
- Spier, Kathy, and Michael D. Whinston. 1995. "On the Efficiency of Privately Stipulated Damages for Breach of Contract: Entry Barriers, Reliance, and Renegotiation," 46 *RAND Journal of Economics* 180-202.

Whitmore, Peter J. 1990. "A Statistical Analysis of Noncompetition Clauses in Employment Contracts," 15 *Journal of Corporation Law* 483.

Williamson, Oliver E. 1975. *Markets and Hierarchies: Analysis and Antitrust Implications*. New York: Free Press.

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