



A note on noncompetes, bargaining and training by firms[☆]

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ABSTRACT

This paper analyzes how noncompetes, via wage bargaining, can affect firms' incentives to provide their employees with on-the-job training. The results show that noncompetes increase incentives to provide general training, but reduce those related to specific training.

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1. Introduction

Traditional law literature (e.g., Blake, 1960) refers to noncompete agreements, or noncompetes (NCs), as contractual clauses under which employees agree not to work for a firm's competitor or to establish a competing business for a defined duration after a contract is terminated, or may agree to limit their disclosure of specified information in the event they continue to work in the same industry. They have become increasingly popular in recent decades and used across a wide range of industries, occupations and employees. Moreover, they have been the subject of considerable controversy and debate inside the law and economics literature. Particularly, while legislatures traditionally justified enforceability of NCs in order to defend employers against the risk of an unrestricted employee sharing trade secrets and customer lists,¹ more recently a number of scholars argued that NCs' enforceability should be expanded to allow firms to protect their investments in employees training (e.g., Callahan, 1985; Long, 2005 and the literature cited therein).

The paradigmatic starting point for economic analysis of NCs and training by firms is Becker's (1964) seminal work on human capital, which traces the classic distinction between general and specific on-the-job training. In Becker's human capital theory there is no need for

NCs. On the one hand, if training is purely general and labor markets are perfectly competitive, employees have every incentive to invest efficiently in on-the-job training since they know they can recoup their investment by quitting the current employer and going to work for any number of other firms. Thus no firms' investments have to be protected through contractual arrangements since no training investments need to be undertaken by them. On the other hand, if training is purely specific, the employer needs no protection, for the worker will leave the firm, simply because there is no other firm to which the worker can sell his/her skills.²

Becker's theory has been revised and extended on numerous occasions. First, as also confirmed by the empirical evidence (e.g., Acemoglu and Pischke, 1999), there are situations in which the Becker's basic result, that firms do not pay for employees' general training, does not hold because of peculiar features of training markets. Secondly, as emphasized first by Williamson (1985), although the presence of quasi-rents, generated by specific investments, reduces the likelihood that the employment relationship will break down, it does not eliminate it. As a consequence, contractual (and organizational) features must be crafted with care to protect firms' specific investments.

These arguments have given rise to the strand of law and economics literature, mentioned above, that discusses the merits of NCs in protecting (and, hence, motivating) training investments by firms. The logic can be summarized as follows: since NCs restrict employees' alternative market opportunities, they reduce the probability that

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¹ See, for instance, La. House Chamber Proceedings Day 20, Discussion of House Bill 1770 (May 7, 2003), as reported in Long (2005, p. 1297).

² Efficient levels of specific on-the-job training generally require, however, that employers share the returns and the costs of investment with their employees.

employees leave the firm after the training phase. Furthermore, by excluding that firms' investments would be used against themselves through competition, NCs also operate to protect firms when employment contracts inevitably terminate. No attention, however, has been paid to the role that such clauses can play in affecting firms' incentives through their effects on the employer–employee wage bargaining process. This paper aims to fill this gap by formal analysis. This will also afford greater insights into desirability to adopt NCs according to the different nature (general or specific) of training investments.³

In order to go into the role of NCs on training by firms, this paper mainly adopts the framework originally proposed by MacLeod and Malcomson (1993). They develop a model of contract (re)negotiation and show as simple contractual solutions can address the well-known holdup problem (e.g., Williamson, 1985; Malcomson, 1997 for the labor market) in relation to different types of investment. In MacLeod and Malcomson (1993), however, attention is restricted to pure self-investments and pure cooperative investments.⁴ By contrast, general training by firms is a hybrid form of cooperative investment since, from one hand, increases the investor's (firm's) revenues when employment continues, while, on the other hand, it is vested in the employee on separation, hence raising his/her alternative market opportunities. Furthermore, this paper concentrates on the role of NCs in that framework, which has not been analyzed in detail before.⁵

2. Model

2.1. Basic framework

The basic framework of this paper is partially modeled along the lines of MacLeod and Malcomson (1993). There are two risk-neutral parties: a firm and an employee. Time is divided into the following phases and, for simplicity, no discounting is assumed. At $t=0$ parties sign a contract that may specify a noncompete clause nc . In particular, $nc=1$ if the clause is included in the contract, and $nc=0$ otherwise.⁶ The training phase is at $t=1$, in which the firm makes the (non-contractible) training $\tau \geq 0$ decision. The investment monetary cost to the firm is τ . At $t=2$ a random parameter θ is realized and it is assumed as distributed according to a continuously differentiable distribution function $F(\theta)$ over a bounded support $[\underline{\theta}, \bar{\theta}]$. The random parameter may be interpreted as shocks affecting conditions that influence the firm–employee transaction value besides their alternative market opportunities. Finally, at $t=3$, after the training investment and the random shock are observed by both parties, the latter negotiate over a wage and, if an agreement is reached, an employment transaction is carried out, that is the firm's revenue is realized and the wage payment is made. However, during the bargaining process, both parties are also free to terminate the

employment relationship, i.e. the employee may decide to quit and the firm may decide to lay the employee off and to hire another one.

Let $\sigma = (\tau, \theta) \in \Sigma$ be the state of the world in $t=3$. For $nc \in \{0,1\}$ and for all $\sigma \in \Sigma$, the firm's revenue at $t=3$ is given by $r = r(\tau, \theta)$, with $r_\tau > 0$, $r_{\tau\tau} < 0$, $\lim_{\tau \rightarrow 0} r_\tau \rightarrow \infty$ and $\lim_{\tau \rightarrow \infty} r_\tau \rightarrow 0$, while alternative market opportunities for the firm and the employee are $\tilde{\pi} = \tilde{\pi}(\theta)$ and $\tilde{w} = \tilde{w}(nc, \tau, \theta)$, respectively. The following general assumptions are introduced:

Assumption 1. For all $\sigma \in \Sigma$, $\tilde{w}(1, \sigma) < \tilde{w}(0, \sigma)$.

Assumption 2. For $nc \in \{0,1\}$ and for all $\sigma \in \Sigma$, $r > \tilde{w} + \tilde{\pi}$.

Assumption 1 states that the employee's alternative market payoff under a noncompete clause is always (strictly) lower than when the clause has not been signed at $t=0$. This clearly stems from the fact that NCs aim to restrict an employee's alternative market opportunities.⁷ Assumption 2, instead, implies that it is always beneficial for parties to trade with each other. This allows us to concentrate on the interaction between NCs and training by firm via wage bargaining alone.

The outcome of the negotiation process over $t=3$, which takes place under fully symmetric information, is crucial for the final results. In the subsequent analysis it is assumed that negotiation can be formalized by a bargaining solution which ensures efficiency and is characterized by the *outside option principle*.

Result 1 (outside option principle). Let $\beta \in (0,1)$ be a measure of the relative bargaining power of the employee. Then, for $nc \in \{0,1\}$ and for all $\sigma \in \Sigma$, the equilibrium ex-post payoffs π^* for the firm and w^* for the employee, when employment continuation is efficient, are unique and satisfy $\pi^* + w^* = r$, where

$$\pi^*(nc, \sigma) = \begin{cases} (1-\beta)r & \text{if } \tilde{w} \leq \beta r \leq r - \tilde{\pi} \\ r - \tilde{w} & \text{if } \beta r < \tilde{w} \\ \tilde{\pi} & \text{if } \beta r > r - \tilde{\pi} \end{cases} \quad (1)$$

Eq. (1) states that parties share the surplus from continued employment according to their relative bargaining power with their alternative market alternatives (outside options) that constitute a lower bound on each party's payoff⁸ but otherwise they do not affect the bargaining outcome.⁹

The firm provides training so as make its marginal expected return (profit) equal to its marginal cost (subject to the non-negativity constraint $\tau \geq 0$). Given Eq. (1), in equilibrium, the firm's optimal training τ^* must satisfy the following f.o.c.:

$$(1-\beta) \int_{\theta: \tilde{w} \leq \beta r \leq r - \tilde{\pi}} r_\tau(\tau^*, \theta) dF(\theta) + \int_{\theta: \beta r < \tilde{w}} \left[r_\tau(\tau^*, \theta) - \tilde{w}_\tau(nc, \tau^*, \theta) \right] dF(\theta) \leq 1, = 1 \text{ for } \tau^* > 0. \quad (2)$$

2.2. General training

Definition 1 (general training). Training is general when, for $nc \in \{0,1\}$ and for all $\sigma \in \Sigma$, $\tilde{w}_\tau = r_\tau$.

³ Pure general and pure specific training represent, indeed, two polar cases and, as pointed out by Becker, actual training by firms generally falls in between. The results that follow, referring to the two extremes, need to be properly interpreted so as to include more general cases as well.

⁴ A pure self-investment generates direct benefits only for the investor, while a pure cooperative investment produces no direct benefits for the investor, but only for the counterpart (see, Che and Hausch, 1999).

⁵ Fella (2005) and Kessler and Lölgesmann (2006) adopt the MacLeod and Malcomson's (1993) framework in order to analyze, respectively, the role of conditional termination penalties on general training and complementarity between employer-sponsored general and specific training. Both, however, do not consider NCs. To the best of the author's knowledge, the only paper that analyzes NCs and human capital investments in an incomplete contracts framework is Posner et al. (2004). They, however, adopt a different solution for contract ex-post bargaining, which is relevant for final results.

⁶ The initial contract may also specify an entry (probation) wage for the subsequent training period ($t=1$). It is assumed, however, that this wage is sufficiently low not to play any role in the employment/bargaining phase at $t=3$ (because, for instance, it is lower than the employee's disutility from work, which, without loss of generality, may be considered as normalized to zero).

⁷ Indeed, in theory, for some states NCs could be not "binding", for instance, because the best alternative opportunity for the worker realizes in a different industry (for which noncompete clause is unenforceable) or because it may consist of leisure. In general, however, workers' best alternative market opportunities are in the same industry, whereby NCs are effective. Since this produces no particularly relevant effects on final results, inequality in Assumption 1 is strong (for all states) in order to capture the most practical case.

⁸ Note, indeed, that $r - \tilde{\pi}$ is the highest payoff the employee can obtain, as the firm can secure its reservation payoff $\tilde{\pi}$ by firing the employee, while \tilde{w} is the lowest payoff the employee can obtain, the payoff to quitting unilaterally.

⁹ This result may be consistent with several extensive-form bargaining games (e.g., Shaked and Sutton, 1984; MacLeod and Malcomson, 1995). See also Malcomson (1997) for several good reasons to adopt the outside option principle for the labor market.

Definition 1 establishes that (pure) general training increases, at the margin, the firm's revenue and the employee's outside option exactly by the same amount.

Result 2. When contract continuation is always efficient, the firm's marginal expected return from general training with $nc=1$ is no lower than with $nc=0$. Hence, NCs (weakly) increase firm's incentives to provide their employees with general training.

Proof. Define with $\bar{\theta}_i(nc=i, \tau) = \{\theta \in [\underline{\theta}, \bar{\theta}] : \tilde{w} \leq \beta r \leq r - \tilde{\pi}\}$ with $i \in \{0, 1\}$. Using the l.h.s. of condition (2) and taking Definition 1 for general training into account, Result 2 can be formally restated as follows:

$$(1-\beta) \int_{\theta \in \bar{\theta}_1} r_\tau(\tau, \theta) dF(\theta) \geq (1-\beta) \int_{\theta \in \bar{\theta}_0} r_\tau(\tau, \theta) dF(\theta), \quad \forall \tau. \quad (3)$$

From Assumption 1, we have that $\theta \in \bar{\theta}_0 \Rightarrow \theta \in \bar{\theta}_1$, which is equivalent to $\bar{\theta}_0 \subseteq \bar{\theta}_1$. This, together with $(1-\beta) > 0$ and $r_\tau(\tau, \theta) > 0$, implies inequality (3). Also note that the inequality (3) is strict iff $\bar{\theta}_1 - \bar{\theta}_0 \neq \emptyset$ (i.e., for any given τ , there is at least one θ such that $\tilde{w}(0, \cdot) > \beta r > \tilde{w}(1, \cdot)$). \square

2.3. Specific training

Definition 2 (specific training). Training is specific when, for $nc \in \{0, 1\}$ and for all $\sigma \in \Sigma$, $\tilde{w}_\tau = 0$.

Definition 2 states that training is (purely) specific when it does not affect the employee's outside option at all.

Result 3. When contract continuation is always efficient, the firm's marginal expected return from specific training when $nc=1$ is no higher than when $nc=0$. Hence, NCs (weakly) decrease firm's incentives to provide their employees with specific training.

Proof. Also define with $\underline{\theta}_i(nc=i, \tau) = \{\theta \in [\underline{\theta}, \bar{\theta}] : \beta r < \tilde{w}\}$ with $i \in \{0, 1\}$. Using the l.h.s. of Eq. (2) and taking Definition 2 for specific training into account, Result 3 can be formally restated as follows:

$$(1-\beta) \int_{\theta \in \bar{\theta}_0} r_\tau(\tau, \theta) dF(\theta) + \int_{\theta \in \underline{\theta}_0} r_\tau(\tau, \theta) dF(\theta) \geq \quad (4)$$

$$(1-\beta) \int_{\theta \in \bar{\theta}_1} r_\tau(\tau, \theta) dF(\theta) + \int_{\theta \in \underline{\theta}_1} r_\tau(\tau, \theta) dF(\theta), \quad \forall \tau.$$

Since $(1-\beta) < 1$ and $\bar{\theta}_0 \cup \underline{\theta}_0 = \bar{\theta}_1 \cup \underline{\theta}_1 = \{\theta \in [\underline{\theta}, \bar{\theta}] : \beta r \leq r - \tilde{\pi}\}$ (which does not depend on nc), condition (4) is satisfied iff inequality (3) holds; thus the proof goes on as for Result 2. \square

3. Concluding remarks

In this paper it has been analyzed how NCs can affect, via wage bargaining, firms' incentives to provide their employees with (general and specific) on-the-job training. In this regard, the results show that NCs increase the firm's incentives to provide general training, but reduce those related to specific training. The logic behind these results can be summarized as follows: NCs, by restricting the employee's alternative market opportunities, reduce, *ceteris paribus*, the probability of the employee's outside option being binding in bargaining

equilibrium and, conversely, increase that of surplus-sharing occurring. But the firm always captures only a fraction of the marginal return on its training investment when surplus-sharing applies. By contrast, when the employee's outside option is binding, the firm obtains no marginal return from investing when training is general and the full marginal return when training is specific.

In relation to general training, such results may resemble Acemoglu and Pischke's (1999) findings that imperfectly competitive markets and other sources of wage compression rise firms' incentives to invest. In fact, NCs lead to a wage that does not always rise one-to-one with workers' marginal product from general skills, independently from the degree of labor market competition. Moreover, while the bargaining outcome (when NCs are effective) recalls the compressed wage structure in Acemoglu and Pischke *at the margin*, the wage schedule differs in absolute terms due to adoption of the outside option principle.

Obviously, previous results must be measured against the arguments concerning the positive effects of NCs, on firms' incentives to train their workers, operating through employment contracts continuation. In this regard, while our results reinforce the supporting arguments for NCs in relation to employer-provided general training, they conflict with those concerning employer-provided specific training. As a consequence, the overall effect of NCs can be to reduce a firm's incentives to supply specific training, when the negative effect, operating via bargaining, outweighs the positive one, acting on employment continuation. This is highly likely to occur especially if specific investments *in se* greatly reduce the probability of parties separating, whereby the positive role of NCs becomes negligible.

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