

*Garden Leave vs. Covenants not to Compete*

by

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## Abstract

*Garden leave* (GL)---when workers are paid but do not work---may be preferred by firms since courts are more likely to enforce GL than they are *covenants not to compete* (CNCs). We consider the impact of GL versus a CNC under different labor market conditions, and show when GL is more profitable than a CNC. Also, assuming it is optimal to offer GL or a CNC, we find (1) the optimal length of either GL or a CNC is the same and is independent of labor market conditions; (2) firms never share more and may share fewer trade secrets with GL than with a CNC; and (3) the extent of innovation will be higher with a CNC than with GL.

## 1. Introduction

Covenants not to compete have become a common feature for many workers. For example, LaVan (2000) believes approximately 80% of newly-hired information technology workers are asked to sign a covenant not to compete (CNC). Fears of workers being poached have apparently caused some large information technology firms---including Google, Yahoo, and Apple---to informally agree not to hire workers from firms they view as partners (Helft, 2009a, 2009b).

For centuries, employers in the U.K. and the U.S. have used CNCs in labor contracts, and courts have tended to view CNCs unfavorably (Callahan, 1985). In the U.S., California, Alabama, and Alaska forbid CNCs, and Texas and Michigan have restricted their use in the past (Den Hertog, 2003). CNCs are commonly used in two situations: when employees generate goodwill (*e.g.* a salesperson who is the face of the firm), and when trade secrets are divulged to employees (Shadowen and Voytek, 1984). In particular, a CNC is used when it is difficult to specify the extent of specialized information acquired by workers (Trebilock, 1986). The case of trade secrets will be the focus herein.

Beginning in the U.K. in 1986,<sup>1</sup> some firms have used an alternative to the usual CNC, employing what are called *garden leave* (GL) provisions. In a CNC, a worker is not allowed to work for a specified period for a competitor for whom the worker might use skills or trade secrets learned at the worker's recent employer. A contract with GL has a similar restriction regarding working for a competitor, and *may* prevent an individual from working at all, but the worker is paid his full salary (including benefits) by his soon-to-be ex-employer. Thus, with GL, the worker is essentially on a paid vacation.

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<sup>1</sup> The case was *Evening Standard Company v. Henderson*.

Lembrich (2002) claims many U.S. firms have begun to use GL because they believe GL is more likely to be enforced than are CNCs.<sup>2</sup> The evidence from the U.K. and the U.S. supports the beliefs of U.S. firms. Klein and Pappas (2009) note U.K. courts have consistently supported contracts with GL, but are less supportive of CNCs. Few U.S. court cases have involved GL, but some cases in N.Y. have dealt with CNCs that had provisions similar to GL. In these cases, “safety net” clauses in CNCs provide for payment to a worker who has attempted to quit and has failed to find alternative employment. In four such cases in New York,<sup>3</sup> the courts noted the significance of the payment to the employee in upholding the quasi-GL.

The purpose of this paper is to compare CNCs and GL when an employee who possesses some form of human capital or trade secrets obtained at a firm may be able to form a “spinout” company. We consider spinouts because they are more successful than other firms in both survival and performance, and are an important source of new firms in the information technology sector, including the following products: semiconductors, rigid disk drives, and laser printers (Franco and Mitchell, 2008). There are several questions we will address.

First, the profitability of GL relative to a CNC is considered. GL involves a higher cost because of the payment to a worker while on GL, but, if GL is more likely to be enforced than a CNC, the latter effect would make GL more profitable than a CNC.

Second, Lembrich (2002) notes it is more costly to extend the length of a GL than it is for a CNC, given the payment to workers on a GL. Thus, we will analyze whether the optimal length of time for a GL differs from that for a CNC.

Third, we consider whether the extent of trade secrets shared with workers differs with GL versus a CNC. One might expect the extent of trade secrets shared would be higher with GL if, again, a contract with GL is more likely to be enforced than is a CNC.

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<sup>2</sup> Stone (2002) asserts there has been a significant increase in court cases involving CNCs in the U.S., but she does not provide any data to support this claim.

<sup>3</sup>The cases are *Lumex Inc v. Highsmith and Life Fitness* (1996), *Ticor Title Insurance Co. v. Cohen* (1999), *Natsource LLC v. Paribello* (2001), and *Estee Lauder Companies Inc. v. Batra* (2006).

Fourth, the extent of innovation with GL and a CNC is compared. Innovation should depend on the expected length of time a spinout exists, and the amount of trade secrets shared with workers.

Fifth, and finally, we consider whether labor market conditions affect the length of GL or a CNC and the amount of trade secrets shared. Specifically, we first consider a *seller's labor market* in which expected compensation exceeds alternative earnings, an example of which is the market for information technology workers in the late 1990s. Then we examine firm behavior in a *buyer's labor market* in which expected compensation equals alternative earnings. The information technology labor market in the early part of the 20<sup>th</sup> century would seem to have been a buyer's market.

CNCs continue to receive a good deal of academic interest. Posner, Triantis, and Triantis (2004) compare CNCs with the alternative remedies of specific performance and liquidated damages. Franco and Mitchell (2008) consider when regions with CNCs will lead to more innovation with spinouts. Kräkel and Sliwka (2009) consider when *not* imposing a CNC may be profitable (because the ability to quit induces a worker to invest in more human capital). Since these issues have already been considered, we ignore them and focus on a firm that may have a spin out, that is either allowed to write a contract with GL or a CNC, and that faces either a seller's or a buyer's labor market.

## **2. Outline of the model**

The model to be used herein is outlined in this section. We do so by listing the basic assumptions of the model.

*Assumption One.* There are two periods of length one. Discounting is ignored. At the beginning of the first period, a firm, F1, chooses an amount of trade secrets,  $s$ , to divulge to an employee and the length of GL or a CNC,  $t$ , with  $t \leq 1$ . The employee works for F1 for the first period. After

one period, there is an exogenous probability,  $q$ , the employee has an opportunity to quit and form a spinout. If the employee quits, F1 receives an immediate judicial decision which tells the firm if the GL or CNC is valid. If a CNC is upheld, for a length of time  $t$ , the employee can work only for a firm that does not use the knowledge embodied in  $s$ . If a GL is upheld, the employee can work for no one for a length of time  $t$ , but continues to be paid by F1 for the period of garden leave.<sup>4</sup>

*Assumption Two.* F1 can not renegotiate compensation when an individual announces a quit. Otherwise, given the revenue assumptions herein, there would be no quits. In order to have both renegotiation and a positive probability of quits with GL or a CNC, we would have to allow revenue to be a random variable as in Posner, Triantis, and Triantis (2004). This would distract from our focus on the differences between GL and CNCs in a world when individuals may quit to form a spinout.

*Assumption Three.* When the individual is employed at F1, revenue per period is  $R = R(s)$ ,  $R(0) = R_0 > 0$ ,  $R' > 0$ , and  $R'' < 0$ , where primes denote partial derivatives. If the individual is on a GL or a CNC, revenue at F1 is  $R_0$ . If the individual operates in a spinout, the additional competitor reduces F1's revenue to  $R_0 - \delta \geq 0$ . Since the employee at F1 increases revenue by the amount  $R - R_0$ , it is assumed the spinout's revenue,  $R_2$ , is this amount minus the reduction due to having a competitor (F1), so  $R_2 = R - R_0 - \delta$ . We further assume  $R_2 > 0$ . The cost to a firm of imparting trade secrets (training the individual) is  $\kappa = \kappa(s)$ ,  $\kappa(0) = 0$ ,  $\kappa' > 0$ , and  $\kappa'' \geq 0$ .

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<sup>4</sup> Lembrich (2002) suggests GL might allow someone to work, although not for a firm that would use the knowledge  $s$ . However, Klein and Pappas (2009) suggest one reason U.S. courts upheld GL provisions (in the few decisions regarding GL that have been rendered) is courts are more willing to allow a firm to dictate to an employee than they are to a former employee. Also, if the wage paid plus the value of leisure received exceeds the wage in alternative employment, then the individual would not choose to work on GL.

*Assumption Four.* The probability a court will uphold a contract with GL is  $P_G = f(t)$ ,  $f' < 0$ .

Presumably  $f(1) = 0$  and  $f(0) = 1$ , but we only require  $f(t) < 1$  for  $t > 0$ . The probability a court will uphold a CNC is  $P_C = \phi f(t)$ ,  $\phi < 1$ ; for any  $t$ , a CNC is less likely to be enforced than is GL.

*Assumption Five.* Alternative earnings per period of  $\omega$  are always available. In a *seller's labor market*, a worker employed at F1 is paid  $\omega$  per period. At first glance, this would not seem to be a seller's labor market because the individual is only paid alternative earnings. However, the possibility exists the worker will form a spinout, in which he receives revenue of  $R_2$ , and it is assumed  $R_2 > \omega$ . Thus, expected earnings for an individual in a seller's labor market exceed  $2\omega$  for two periods. In a *buyer's labor market*, F1 sets a wage so expected compensation for an individual just equals  $2\omega$ .

### 3. Garden leave and covenants not to compete with a seller's labor market

Consider expected profit for a firm (F<sub>1</sub>) in a seller's labor market with a CNC,  $\pi_C^{Seller}$ . The firm has revenue of  $R$  for the first period, and also has  $R$  with a probability of  $1 - q$  for the second period. With a probability of  $q(1 - P_C)$ , the individual quits and immediately works in a spinout; F<sub>1</sub>'s revenue is then  $R_0 - \delta$  for the second period. With a probability of  $qP_C$ , the individual quits and the CNC is upheld. In this case, F<sub>1</sub>'s revenue is  $R_0$  for  $t$  of the second period (because F<sub>1</sub> then does not have competition from the spinout), and is  $R_0 - \delta$  for  $1 - t$  of the second period (when the spinout is active). The firm pays the going wage,  $\omega$ , for the first period, also pays  $\omega$  for the second period with a probability of  $1 - q$ , and incurs cost of  $\kappa$  to impart trade secrets to the individual. We then have expected profit:

$$\pi_C^{Seller} = (2 - q)(R - \omega) + q[R_0 - \delta(1 - tP_C)] - \kappa \quad (1)$$

Expected profit with GL,  $\pi_G^{Seller}$ , is the same as with a CNC except  $P_G$  replaces  $P_C$  and the individual is paid  $\omega$  while on GL. Thus, expected profit is:

$$\pi_G^{Seller} = (2 - q)(R - \omega) + q[R_0 - \delta(1 - tP_G) - t\omega P_G] - \kappa \quad (2)$$

The necessary and sufficient conditions for profit maximization with GL and a CNC are, with  $\xi_{f,t}$  the elasticity of  $f$  with respect to  $t$ :

$$\frac{\partial \pi_C^{Seller}}{\partial t} = \phi \delta q (tf' + f) = \phi \delta q f (1 + \xi_{f,t}) = 0, \quad (3)$$

$$\frac{\partial^2 \pi_C^{Seller}}{\partial t^2} = \phi \delta q (tf'' + 2f') < 0, \quad (4)$$

$$\frac{\partial \pi_C^{Seller}}{\partial s} = (2 - q)R' - \kappa' = 0, \quad (5)$$

$$\frac{\partial^2 \pi_C^{Seller}}{\partial s^2} = (2 - q)R'' - \kappa'' < 0, \quad (6)$$

$$\frac{\partial \pi_G^{Seller}}{\partial t} = q(\delta - \omega)(tf' + f) = qf(\delta - \omega)(1 + \xi_{f,t}) = 0, \quad (7)$$

$$\frac{\partial^2 \pi_G^{Seller}}{\partial t^2} = q(\delta - \omega)(tf'' + 2f') < 0, \quad (8)$$

$$\frac{\partial \pi_G^{Seller}}{\partial s} = (2 - q)R' - \kappa' = 0, \quad (9)$$

$$\frac{\partial^2 \pi_G^{Seller}}{\partial s^2} = (2 - q)R'' - \kappa'' < 0. \quad (10)$$

From *ineqs.* (6) and (10), an interior solution for  $s$  is assured by the assumptions  $R'' < 0$  and  $\kappa'' \geq 0$ . From *eqs.* (5) and (9), in our model, in a seller's labor market, the possibility of GL as opposed to a CNC does not change the firm's optimal choice in sharing trade secrets. Note, the

optimal  $s$  would be the same if there were no CNC or GL since the FOC for  $s$  with either GL or a CNC is independent of  $t$ .

Using *ineq.* (4), with a CNC, an interior solution for  $t$  requires  $tf''' + 2f'' < 0$ , and we assume this condition holds. From *eq.* (3), the FOC for  $t$  with a CNC requires  $\xi_{f,t} = -1$ . A firm choosing  $t$  with a GL would never set  $t > 0$  unless  $\delta > \omega$ . Per unit of time, F1 gains  $\delta$  by not having a competitor, and spends  $\omega$  while the individual is on GL. Thus, the SOC for  $t$  with GL (*ineq.* (8)) also requires  $tf''' + 2f'' < 0$ , and, with  $\delta > \omega$ , the FOC for  $t$  with GL (*eq.* (7)) again requires  $\xi_{f,t} = -1$ . Thus, in a seller's labor market, the optimal length of a GL is positive and is identical to that of a CNC.

Recall Lembrich's (2002) suggestion (Section 1 herein) it is costlier to extend a GL than it is to extend a CNC---since those on GL are paid. With a CNC, the firm gains  $\delta$  as it extends the expected length of the CNC. Similarly, with GL, a firm gains  $\delta - \omega$  by extending the expected length of the GL. Thus, with a CNC, as long as  $\delta > 0$ , and, with GL, as long as  $\delta - \omega > 0$ , the firm would like to extend the expected length of the CNC as far as possible. What limits the optimal choice of  $t$  is the tradeoff from altering  $t$ , which is reflected in the term  $1 + \xi_{f,t}$ . When  $t$  is increased by one unit, the direct effect is to increase the expected length of GL or a CNC by one, and the indirect effect is to decrease the expected length of GL or a CNC by reducing the likelihood of enforcement by a court. The latter effect is captured in the negative elasticity term  $\xi_{f,t}$ . Thus, the value of  $t$  that maximizes the expected length of GL or a CNC is that for which  $\xi_{f,t} = -1$ .

Since, in a seller's labor market, the optimal values for  $s$  and  $t$  are the same with GL or a CNC, we can compare expected profit with either GL or a CNC. Using *eqs.* (1) and (2), profit is higher with GL than with a CNC if:

$$\delta(1 - \phi) > \omega. \tag{11}$$

The smaller is  $\phi$ , the larger the difference between  $P_G$  and  $P_C$ . The gain to the firm (F1) from either GL or a CNC comes from saving  $\delta$  by postponing the time when F1 has competition. Thus, the relative gain from GL versus a CNC is  $\delta(1-\phi)$ . The cost to F1 from GL, relative to a CNC, is the payment of  $\omega$  to the individual during the GL. Thus, the larger is  $\delta$  and the smaller are  $\phi$  and  $\omega$ , the more likely F1 prefers GL to a CNC. If the courts viewed GL and CNCs as roughly equivalent, given  $t$ , then  $\phi \approx 1$  and a CNC would be preferred to GL by F1.

#### 4. A buyer's labor market

We now consider the choice problem for the firm, F1, when there is a buyer's labor market and the firm can adjust its wage so the individual's expected compensation for two periods---including possible earnings in a spinout---just equals  $2\omega$ . It will be shown  $s$  is not the same with GL and a CNC, so, without specific functional forms for  $R$  and  $\kappa$ , we can not compare profit with GL and a CNC. However, we will be able to compare the expected wage bills with GL and a CNC, respectively  $EWB_G$  and  $EWB_C$ , and, since we will require these terms to determine the profit terms to be maximized, we first find the wages with GL or a CNC, respectively  $W_G$  and  $W_C$ , and then we find  $EWB_G$  and  $EWB_C$ .

Consider the individuals expected utility with a CNC,  $U_C$ . For the first period, and for the second period with a probability of  $1 - q$ , the individual is paid  $W_C$ . With a probability of  $qP_C$ , the individual quits and is able to earn  $\omega$  elsewhere during a CNC for a period of  $t$ . With the same probability the individual earns  $R_2 = R - R_0 - \delta$  for a period  $1 - t$ . With a probability of  $q(1 - P_C)$ , the CNC is not upheld, and the individual earns  $R_2$  for the entire second period. Thus we have:

$$U_C = (2 - q)W_C + qt\omega P_C + (1 - t)qP_C R_2 + (1 - P_C)qR_2. \quad (12)$$

Setting  $U_C = 2\omega$ .

$$W_C = \frac{(2 - qtP_C)\omega - qR_2(1 - tP_C)}{2 - q}. \quad (13)$$

Note,  $W_C|_{q \rightarrow 0} = \omega$ , and  $W_C$  is inversely related to  $q$ :

$$\frac{\partial W_C}{\partial q} = (+)(1 - tP_C)(\omega - R_2) < 0, \quad (14)$$

since no one would quit for a spinout if  $\omega > R_2$ ; the individual would go elsewhere and earn  $\omega$ . Since F1 pays  $W_C$  for an expected length of time of  $2 - q$ ,  $EWB_C$  is simply the numerator of  $W_C$ :

$$EWB_C = (2 - qtP_C)\omega - qR_2(1 - tP_C). \quad (15)$$

The determination of  $U_G$  is similar to that of  $U_C$  except the individual is paid  $W_G$  and receives leisure worth  $v$  while on GL. Thus:

$$U_G = [2 - q(1 - tP_G)]W_G + qtvP_G + qR_2(1 - tP_G). \quad (16)$$

Setting  $U_G = 2\omega$ .

$$W_G = \frac{2\omega - qtvP_G - qR_2(1 - tP_G)}{2 - q(1 - tP_G)}. \quad (17)$$

We find  $W_G|_{q \rightarrow 0} = \omega$ , and  $W_G$  is inversely related to  $q$ :

$$\frac{\partial W_G}{\partial q} = (+)[(1 - tP_G)(\omega - R_2) - tvP_G] < 0. \quad (18)$$

Now F1 pays  $W_G$  in the first period, in the second period for the entire time with a probability of  $1 - q$ , and for  $t$  of the second period with a probability of  $qP_G$ . Thus the expected length of time  $W_G$  is paid is  $2 - q(1 - tP_G)$ , so  $EWB_G$  is the numerator of  $W_G$ :

$$EWB_G = 2\omega - qtvP_G - qR_2(1 - tP_G). \quad (19)$$

For  $q > 0$ , both  $W_C$  and  $W_G$  are less than  $\omega$ . The wage bill is higher with GL than with a CNC because the individual is paid while on GL. However, the value of leisure,  $v$ , received on a GL implies F1 can pay a lower wage with GL. We have  $EWB_G > EWB_C$  if:

$$(1 - \phi)R_2 + \phi\omega > v. \quad (20)$$

With  $R_2 > \omega$ , the minimum value for the LHS of *ineq.* (20) =  $\omega$ . However,  $\omega \geq v$  or no one would work. Thus,  $EWB_G \geq EWB_C$ , with the strict equality holding if either  $\omega > v$  or  $\phi < 1$ . Thus, even though the firm can reduce  $W_G$  due to the leisure an individual would receive on GL, the fact one is paid with GL and is not paid on a CNC dominates, and the expected wage bill is never smaller on GL than with a CNC.

Now consider expected profit with either GL or a CNC, respectively  $\pi_C^{Buyer}$  and  $\pi_G^{Buyer}$ . With GL and with a CNC, expected revenue is determined as in a seller's labor market, except we now have the revenue terms in the expected wage bills. Profit is simply expected revenue minus the expected wage bill minus  $\kappa$ , so we have:

$$\pi_C^{Buyer} = R(2 - tqP_C) + q[tP_C(R_0 + \omega) - 2\delta(1 - tP_C)] - 2\omega - \kappa, \quad (21)$$

$$\pi_G^{Buyer} = R(2 - tqP_G) + q[tP_G R_0 - 2\delta(1 - tP_G) + vtP_G] - 2\omega - \kappa. \quad (22)$$

Maximizing  $\pi_C^{Buyer}$  and  $\pi_G^{Buyer}$  with respect to  $t$  and  $s$  yields:

$$\frac{\partial \pi_C^{Buyer}}{\partial t} = q\phi(\delta + \omega - R_2)(tf' + f) = q\phi(\delta + \omega - R_2)(1 + \xi_{f,t}) \leq 0, \quad (23)$$

$$\frac{\partial^2 \pi_C^{Buyer}}{\partial t^2} = q\phi(\delta + \omega - R_2)(tf'' + 2f''), \quad (24)$$

$$\frac{\partial \pi_C^{Buyer}}{\partial s} = (2 - tqP_C)R' - \kappa' = 0, \quad (25)$$

$$\frac{\partial^2 \pi_C^{Buyer}}{\partial s^2} = (2 - tqP_C)R'' - \kappa'' < 0. \quad (26)$$

$$\frac{\partial \pi_G^{Buyer}}{\partial t} = q(\delta + v - R_2)(tf' + f) = qf(\delta + v - R_2)(1 + \xi_{f,t}) \leq 0, \quad (27)$$

$$\frac{\partial^2 \pi_G^{Buyer}}{\partial t^2} = q(\delta + v - R_2)(tf'' + 2f''), \quad (28)$$

$$\frac{\partial \pi_G^{Buyer}}{\partial s} = (2 - tqP_G)R' - \kappa' = 0, \quad (29)$$

$$\frac{\partial^2 \pi_G^{Buyer}}{\partial s^2} = (2 - tqP_G)R'' - \kappa'' < 0. \quad (30)$$

*PROPOSITON ONE. In a buyer's labor market, assuming  $tf'' + 2f'' < 0$  &  $\omega > v$ :*

- I. if  $\delta < R_2 - \omega$ ,  $t = 0$  with GL or a CNC;
- II. if  $R_2 - \omega < \delta < R_2 - \nu$ ,  $t = 0$  with GL, and  $t$  is the solution to  $\xi_{f,t} = -1$  with a CNC;
- III. if  $R_2 - \nu < \delta$ ,  $t$  is the solution to  $\xi_{f,t} = -1$  with either GL or a CNC.

*Proof of Proposition One.* Consider the FOC for  $t$ , ineqs. (23) and (27). In both these expressions, the first term in parentheses is independent of  $t$  and only by chance would equal zero. Thus, an interior solution for  $t$  requires  $\xi_{f,t} = -1$ . Using the SOC for  $t$  with a CNC, eq. (24), if  $tf''' + 2f'' < 0$ , the SOC requires  $\delta + \omega - R_2 > 0$  or  $\delta > R_2 - \omega$ . If  $\delta < R_2 - \omega$ ,  $\frac{\partial^2 \pi_C^{Buyer}}{\partial t^2}$  is positive, the interior solution for  $t$  is at a minimum of profit, and we have a corner solution with  $t = 0$ . The reason the firm chooses  $t = 0$  and not  $t = 1$  is simple. If a quit occurs and  $t = 0$ , F1 loses  $\delta$  by having a competitor for the entire second period, but gains  $R_2 - \omega$  because it can lower the expected wage bill by that amount since that is the gain to an individual from a spin out versus alternative earnings. Thus, if  $\delta < R_2 - \omega$ ,  $t = 0$  is optimal.

With GL, the SOC for  $t$ , eq. (28), holds only if  $\delta + \nu - R_2 > 0$ , or if  $\delta > R_2 - \nu$ . If a quit occurs and  $t = 0$ , F1 loses  $\delta$  by having a competitor and gains  $W_G$  by not paying during GL, but the firm gains  $R_2 - \nu - W_G$  because it can lower the expected wage bill by that amount since that is the gain to an individual from a spin out versus leisure and being paid while on GL. Thus, with GL, the firm prefers  $t = 0$  if  $R_2 - \nu - W_G > \delta - W_G$ , or if  $R_2 - \nu > \delta$ . ■

In a buyer's labor market, when a firm sets its wage, it takes account of the effect of GL or a CNC on the expected compensation of one it hires. In the model herein, it always is optimal to have a CNC or GL of positive (and identical) length in a seller's labor market. However, in a buyer's labor market, the gain to the firm in lower wages when there is no CNC or GL implies it is not always optimal to choose a CNC or GL. With  $\omega > \nu$ , the net gain to the firm from not choosing GL exceeds that for not choosing a CNC,  $R_2 - \nu$  versus  $R_2 - \omega$ . Thus, GL is even less likely to be profitable to a firm than is a CNC. If a CNC or GL is used in a buyer's labor market,

we found the optimal length to be the same, and also equal to the level in a seller's labor market:

$$t_C^{Buyer} = t_G^{Buyer} = t_C^{Seller} = t_G^{Seller} .$$

*PROPOSITION TWO. The level of trade secrets shared with an individual,  $s$ , is higher in a buyer's labor market than in a seller's labor market, and is the highest with a CNC:*

$$s_C^{Buyer} > s_G^{Buyer} > s_C^{Seller} = s_G^{Seller} .$$

*Proof of Proposition Two.* With buyer's and sellers labor market, and with either GL or a CNC, all four FOC for  $s$ ---eqs. (5), (9), (25), and (29)---have  $(2 - x)R' - \kappa' = 0$ , where  $x$  depends on the situation. In a seller's labor market,  $x = q$  with GL or a CNC. In a buyer's labor market,  $x = tqP_C$

with a CNC, and  $x = tqP_G$  with GL. Differentiating the FOC for  $s$ ,  $\frac{ds}{dx} = \frac{R'}{SOC} < 0$  (by the SOC).

Thus,  $s$  is largest when  $x$  is smallest, so with  $P_C < P_G < 1$ ,  $s_C^{Buyer} > s_G^{Buyer} > s_C^{Seller} = s_G^{Seller}$ . ■

The reason for this result is a higher  $s$  raises  $R$  and  $R_2$ , thereby lowering what  $F1$  must pay to attract an individual in a buyer's labor market. Since a CNC is less likely to be upheld than GL, an increase in  $s$  lowers the wage with a CNC more than it does with GL because the individual is more likely to earn  $R_2$  for the entire second period with a CNC. Thus, raising  $s$  is more profitable with a CNC than with GL.<sup>5</sup>

## 5. Innovation

As noted in Section One, spinouts are an important source of new firms in the information technology sector (Franco and Mitchell, 2008). One might expect the extent of innovation to be a positive function of 1) the amount of trade secrets shared with individuals who may spinout,  $s$ , and 2) the expected length of time a spinout exists,  $L$ . We do not consider the

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<sup>5</sup> Note, if the wage is based on rent sharing with the individual, it can also be shown  $s$  is larger with a CNC than with GL.

optimal amount of innovation. Rather, we simply focus on any differences in innovation between GL and CNCs.

First, consider  $L$ . Assuming there is an interior solution for  $t$  with either GL or a CNC in a buyer's labor market, then  $t$  is the same with GL or a CNC and in either a buyer's or a seller's labor market. With  $P_G = f$  &  $P_C = \phi f$ , a spinout with a CNC occurs if there is a quit, which has a probability of  $q$ , and lasts for the entire second period with a probability of  $1 - P_C$ , and for  $1 - t$  of the second period with a probability of  $P_C$ . Similar logic follows for GL, so:

$$L_C = q[1 - P_C + (1-t)P_C] = q[1 - t\phi], \quad (31)$$

$$L_G = q[1 - P_G + (1-t)P_G] = q[1 - tf]. \quad (32)$$

Now  $L_C > L_G$  with  $\phi < 1$ . Thus, if GL or a CNC exists, the expected length of a spinout is longer with a CNC because a CNC is less likely to be upheld by the courts. However, from *Proposition One*, in a buyer's labor market, we are less likely to have a GL than we are to have a CNC if alternative earnings exceed the value of leisure,  $\omega > v$ . Thus, only in a seller's labor market is the expected length of a spinout unambiguously longer with a CNC than with GL.

In a seller's labor market,  $s_C = s_G$ , and, in a buyer's mkt.,  $s_C > s_G$ . Thus, in a seller's labor market, because  $L_C > L_G$ , and  $s_C = s_G$ , there should be more innovation with a CNC than with GL. In a buyer's labor market, if there is a CNC or GL,  $L_C > L_G$ , so, because  $s_C > s_G$  in this case, there would be more innovation with a CNC than with GL for two reasons.

However, as noted, a CNC is more likely than is GL in a buyer's labor market, so, for this reason, the expected length of a spinout will be longer in a world in which GL is available (but a CNC is not) than it would be in a world when a CNC is available (but GL is not). This fact alone implies GL will lead to more innovation than would a CNC. Additionally, from *eqs.* (25) and (29), the marginal benefit from raising  $s$  is larger when  $t$  is zero than it is when  $t > 0$ . Thus, since

a GL is less likely to occur than is a CNC in a buyer's labor market, for this reason, the expected level of  $s$  will tend to be higher with GL than with a CNC.

In sum, we expect more innovation in a seller's labor market with GL than with a CNC, but, in a buyer's labor market, it is unclear whether a CNC or GL will lead to more innovation.

## **6. Conclusion**

Garden leave has become more common in the U.S. in recent years (Lembrich, 2002, Klein and Pappas, 2009) because courts are believed to be more likely to enforce garden leave than they are to enforce a covenant not to compete. The greater likelihood of enforcement must be balanced by the fact a firm continues to pay an individual on garden leave. In the case of a seller's labor market---when the firm must pay a wage equal to that available elsewhere--- we were able to show when garden leave would be more profitable than a covenant not to compete. However, even though garden leave may be more profitable than a covenant not to compete, garden leave produces results that may not be desirable. Conditional upon a firm desiring either garden leave or a covenant not to compete, we find the former is never associated with the sharing of more trade secrets or more innovation. Thus, the social benefits of garden leave versus covenant not to compete may be questionable, and should be examined if garden leave will continue to be a part of employment contracts.

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