Labor Leasing, Direct Hiring, and Efficiency Wages

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Abstract Labor leasing, a variant of outsourcing, has an economies-of-scale advantage over direct hiring in lowering nonwage acquisition costs. Particularly, if economies of scale reduce the leasing rate more than a leasing firm’s monopsony power raises it, the leasing rate exhibits a descending scale and thus makes expanded leasing employment non-inflationary. It is shown in an optimization framework that the efficiency wages paid to directly hired workers are negatively related to the leasing employment in the same firm but positively related to nonwage acquisition costs, and therefore producing firms tend to substitute leased workers for directly hired workers.

Keywords: labor leasing, economies of scale, efficiency wage

JEL Classification: J30, J32, J41

1. Introduction

Labor leasing has become an important labor-market practice in the U.S. and many European countries, as business firms are increasingly concerned about costs of personnel administration and medical expenditures. Labor leasing allows business employers to outsource non-revenue generating employee administrative duties so they can focus on productive side of the business. Under labor leasing, a producing firm could essentially “fire” its workers initially and let a labor-leasing firm hire them afterwards, and the leasing firm immediately leases them back to the same producing firm for a rent that well covers the expenditure of payroll, taxes, insurance, benefits and administration but lowers administrative cost. Although employee leasing provides an alternative form of employment that differs from the traditional direct hiring, there is unfortunately a notable dearth of the formal economic analysis of labor leasing in the existing literature.

The relevant economics literatures are the dual labor market theory and the studies of temporary work force. Dualists see the overall labor market as divided into two separate and non-competing segments: a primary market with high wages and stable employment, and a secondary market with the opposite (Reich, et al, 1973; Vitorisz and Harrison, 1973; Taubman and Wachter, 1986; Saint-Paul, 1996). Instead of being two different labor-market segments based on the differences in workers’ backgrounds such as education and experience, labor leasing and direct hiring are two different labor-exchange mechanisms based on whether the demand for labor meets the supply of labor directly in the market or
through labor intermediation. Furthermore, unlike in the temporary help industry, when a client of the leasing firm transfers most or perhaps all of its workforce to the payroll of the leasing firm, leased workers are often the client’s former employees; many leased workers in fact hold exactly the same posts in the firm except receiving their payrolls from the leasing firm.

In the thread of employee leasing literature, the work of Mangum, Mayall, and Nelson (1985) represents an attempt to explore the phenomenal growth of the “temporary help industry” that releases firms from long-term financial commitments to workers or from the concerns of unionization. Nash and Flesher (2005) further provides a historical perspective of the corporate motivations for using contingent labor force such as employee leasing. They argue that employee leasing can not only reduce heavy burden of administrative and fringe benefit costs but also help employers obtain workforce without making heavy investment in training and other human resources. Particularly, the flexibility of using leased workers allows firms to staff up during peak times and eliminate the necessity of hoarding employees during low periods, so they can promptly respond to market and economic changes, avoiding productivity losses caused by temporary shutdowns, strikes, and wage/benefit increase demanded by its core workforce.

This paper is to explore the determination of the leasing rate and leasing employment in the dual structure of labor exchanges in which both direct hiring and leasing are available. Possessing some monopsony power on hiring, a leasing firm serves as a labor-exchange intermediary and profits from the difference between the leasing rate it acquires and the unit hiring cost it pays. The wage schedule for leased workers is essentially determined in the labor market in which the leasing firm has monopsony power. A producing firm that leases workers cannot manipulate the leased workers’ wages to enhance their production efficiency even if leased workers’ efficiency increases with their wages. Although the producing firm pays the efficiency wages to its workforce hired directly from the labor market, it is the wage-productivity nexus in the dual labor-exchange mechanism that plays an important role in setting the efficiency wage (see Solow, 1979; Shapiro and Stiglitz, 1984; Cappelli and Chauvin, 1991). The asymmetry in wage determination for the two labor exchanges in turn determines employment in labor leasing and direct hiring.

We address the following questions in a theoretical approach: 1) How does a profit-maximizing producing firm that can acquire workers from leasing as well as direct hiring determine the leasing rate and leasing employment jointly with a leasing intermediary? 2) How does employee leasing impact on the efficiency wage and employment for directly hired workers? The brief plan of this paper is as follows. Section 2 analyses the behavior of the representative leasing firm and representative producing firm. Section 3 discusses the determination of leasing employment and the substitution relationship between leased workers and directly hired workers. Section 4 considers the impact of labor leasing on the efficiency wage of directly hired workers and the demand for them. Section 5 concludes the paper.
2. Leasing Firm versus Producing Firm

Suppose that a typical producing firm (e.g., a manufacturing firm) obtains part of its workforce by contracting with a leasing firm for the services of leased employees who are on the payroll of the leasing firm. Here, the leasing firm acts as a lessor while the producing firm as a lessee. Figure 1 sketches the financial and non-financial linkages that exist among the labor-leasing firm, the producing firm (the client of the leasing firm), leased workers, and the core workers who are directly hired.

In this study, the fundamental feature of labor leasing is that leased workers are not the employees of the firm in which they work. The industrial relations for leased workers in a producing firm become rather simple: leased workers make their effort in production, and the producing firm simply monitors workers’ performance and reports to the employee-leasing firm. For leased workers, the producing firm looks only like the production department of a traditional firm while the leasing firm looks like both the personnel and bursar departments that are in full charge of hiring, firing, staffing, wage payments, benefits, and even training. The leasing firm pays wages and benefits to leased workers for the entitlement to lease, and the producing firm pays back the leasing firm a fixed total amount of rent for a given number of contracted leased workers. As a labor-market intermediary acting between employees to be leased and the producing firm that need contingent services, the leasing firm profits by charging a leasing rate on the subscribing firm above its unit labor cost.

The total cost incurred by the leasing company has two components: wage costs and nonwage acquisition costs. The leasing firm has some monoposonistic hiring power in the market for leased workers either because the number of leasing agencies is small (alternatively, a leasing firm is large in relation to the market for leased workers) or because employees are immobile. As a result, the wage rate, \( w(l) \), that the leasing company pays varies directly with the number of leased workers employed \( l \), i.e., \( w'(l) > 0 \). Nonwage acquisition costs include personnel administration costs and group health insurance expenditures, etc. Unlike wage costs, however, the unit nonwage acquisition cost, \( a(l) \), varies inversely with the number of workers whom the leasing company hires (\( a'(l) < 0 \)) due to the effect of economies to scale. The leasing firm contracts with many producing firms so that it can greatly lower personnel administration costs and get a favorable group rate for the health insurance package. Therefore, employee leasing exhibits a comparative advantage in reducing nonwage acquisition costs relative to the traditional labor exchange through direct hiring; the latter is assumed to have a constant acquisition cost.

The leasing company chooses the number of leased workers \( l \) to maximize its profit. The first-order optimality condition determines the leasing rate schedule:

\[
  r(l) = w'(l)l + w(l) + a'(l)l + a(l),
\]

where \( r \) is the leasing rate, \( w(l) \) and \( a(l) \) are assumed to be two linear functions of \( l \). The leasing rate above reflects the marginal hiring cost associated with monopsony, \( w(l)l + w(l) \), and the marginal benefit from the economies of scale, \( a'(l)l + a(l) \). Specifically, the effect of monoposonistic hiring power on wages indicates that hiring an extra leased worker involves a
higher wage rate for the additional worker as well as all the workers who are previously leased (or the intra-marginal workers), whereas the effect of economic scale on nonwage acquisition cost suggests that employee leasing reduces nonwage acquisition costs for all the currently leased workers including the worker on the margin. The two opposite effects jointly influence the leasing rate charged by the leasing firm. Depending on which effect dominates, the leasing rate schedule could be positively or negatively sloped, according to (1). Taking derivative of (1) with respect to \( l \) yields

\[
r'(l) = 2[w'(l) + a'(l)].
\]  

(2)

Figure 2a and 2b show a graphical derivation of the leasing rate schedule in a four-quadrant diagram. Figure 2a presents an upward-sloping leasing rate schedule when the effect of monopsonistic hiring power on wages exceeds the effect of economic scale on nonwage acquisition cost; and Figure 2b displays a downward-sloping leasing rate schedule, indicating a greater effect of economic scale on nonwage acquisition cost relative to the effect of monopsonistic hiring power on wages. For two given levels of leased labor, each figure graphically derives, with the help of two 45° degree lines, two points on the leasing rate schedule by summing up the monopsony marginal hiring cost, \( w(l)l + w(l) \), and the marginal benefit associated with economies of scale, \( a(l)l + a(l) \). The schedule of the leasing firm’s marginal revenue of leased labor, \( r'(l)l + r(l) \), lies above (below) the leasing-rate schedule if the leasing-rate schedule is upward (downward) sloping. The appendix at the end of this paper shows that the \( r'(l)l + r(l) \) schedule is steeper than the leasing-rate schedule.

The producing firm, on the other hand, needs to decide on how many workers it hires directly from the competitive labor market (denoted by \( L \)) and how many leased workers it takes from the labor-leasing firm (denoted by \( l \)). Assuming that the economy is less than fully employed, the producing firm sets the wage rate, \( W \), for directly hired workers in order to induce the maximum labor effort for each dollar the firm pays. Because employee leasing has lifted the burdens of recruiting, payroll, and government paperwork for the producing firm, the producing firm only needs to pay the leasing firm a leasing fee, \( rl \), for the service of leased workers, which in turn backs up the leasing firm’s payroll from which a leased worker is paid \( w \). Finally, the producing firm still needs to pay a constant unit nonwage acquisition cost \( A \) for each directly hired worker.

Suppose that leased and directly hired workers exhibit the same response of work efforts to their respective wages. The efforts, denoted by \( e \), are increasing functions of wages: \( e'_W > 0 \), and \( e'_W > 0 \); and leisure is assumed to be a normal good so that \( e''_{WW} < 0 \) and \( e''_{WW} < 0 \). Whereas the wage rate \( W \) plays a role as a “carrot” factor in stimulating effort of these directly hired workers, the number of leased workers \( l \) that appears in the effort function plays a role as a “stick” factor to directly hired workers: the more the producing firms rely on labor leasing, the more diligently the directly hired workers have to work in order to secure their jobs. Therefore, the effort of directly hired workers depends on the number of leased workers as well as the wage rate, i.e., \( e(W, l) \); like the “carrot” factor, the “stick” factor also has the positive first-order effects on the effort: \( e'_l > 0 \). The effort of directly hired workers with respect to labor leasing is subject to the law of diminishing marginal returns: \( e''_l < 0 \). Furthermore, higher wage lessens the “stick” effect whereas more leasing employment
reduces the “carrot” effect, suggesting a negative second-order cross effect: $e''_m < 0$.

The efforts of leased workers, on the other hand, are not concurrently available to the leasing firm that pays the workers; instead, their performance can only be observed when the leased workers are actually working in their production processes for the producing firm. Due to the separation of production performance from wage payment under labor leasing, it is the leasing firm’s monopsonistic wage schedule rather than the efficiency wage that plays a dominant role in determining the efficiency unit of each leased worker, whereas the efficiency wage chosen by the producing firm determines the efficiency unit of each directly hired worker.

Analytically, the producing firm chooses $L$, $W$, and $l$ to maximize its profit

$$f[e(W,l)L + e(w(l))l] - WL - AL - r(l),$$

where $f[\cdot]$ is the firm’s production function that satisfies typical analytical properties of $f'>0$ and $f''<0$, and the product price is normalized to unity for the purpose of simplification. The first-order conditions for $L$, $W$, and $l$ are respectively

$$f'[e(W,l)L + e(w(l))l]e(W,l) = W + A,$$

$$f'[e(W,l)L + e(w(l))l] = \frac{1}{e''_W(W,l)},$$

$$f'[e(W,l)L + e(w(l))l][e'_l L + e'(w)w'(l)l + e(w(l))] = r'(l)l + r(l).$$

Equation (4) states that the producing firm employs workers through direct hiring until the marginal product of effective labor equals the marginal labor cost. According to (5), the firm should optimally set the wage rate for directly hired workers such that the marginal product of effective labor induced by higher wages equals the extra wage cost. Finally, equation (6) describes the similar optimality condition for leased workers: the producing firm should optimally use leased workers until the marginal product of (effective) leased labor, i.e., MPLL (the LHS of (6)), is equal to its marginal leasing cost, i.e., MLC (the RHS of (6)), $r'(l)l + r(l)$, which, to the leasing firm, is the marginal revenue of leased labor. Relating the marginal product of effective leased labor to the quantity of leased labor being used, the MPLL schedule also becomes the demand curve for leased workers.

Examining the MPLL schedule, there are three sources for total products to increase as the producing firm uses an extra leased worker. First, the effort from the newly leased worker, $e(w(l))$, leads to an increase in output. Next, as the leasing firm hires an additional worker, it must raise the wage rate across board to the marginal worker’s pay level and thus leads to more working effort from all the “intra-marginal workers”, as shown by the term $e'(w)w'(l)l$; under the circumstances, the leasing firm’s monopsony power enhances productivity as the producing firm farms out more job opportunities to leased workers. Finally, as a result of the “stick” effect all the directly hired workers work harder by $e'L$. Differentiating the MPLL
schedule with respect to \( l \) produces

\[
\frac{f''(\cdot)[e'(L + e'(w)w'/l + e(w)]^2 + f''(\cdot)[e''(L + e''w^2 l + 2e'(w)w']}{2}
\]

It follows that the MPLL is downward sloping as long as marginal productivity and marginal efforts are sufficiently diminishing, i.e., \( f''(\cdot) \) and \( e''(\cdot) \) are sufficiently large in their absolute values.

3. Determination of Leasing Cost for a Producing Firm

The cost of labor leasing, \( rl \), for a representative producing firm depends on the number of leased workers and the leasing rate. Based on the leasing-rate schedule offered by the leasing firm, the producing firm decides on how many leased workers it needs by weighing the marginal product of leased labor against the marginal leasing cost. The resulting number of leased workers demanded in turn determines the wage rate of these leased workers on the leasing firm’s monopsonistic wage schedule and the leasing rate from the leasing rate schedule. Figure 3 depicts the joint determination of the leasing rate and leasing employment, in which the determination of leasing employment is actually a graphical translation of equation (6) of the producing firm’s optimization problem.

Depending on the relative magnitude of the unit acquisition cost, \( a(l) \), and the wage rate, \( w(l) \), the leasing rate can be either on an ascending scale or on a descending scale. If the leasing firm does not possess a sufficient advantage in lowering acquisition costs by hiring more leased workers, the leasing rate is dominated by the leasing firm’s monopsony power and thus the leasing rate is on an ascending scale. For a given demand schedule for leased workers, which is determined by marginal product of leased workers, the leasing firm optimally hires \( l_1 \) workers and leases them to the producing firm. The leasing rate on the margin must be lower than marginal leasing cost that the leasing firm incurs, as the leasing firm has to adjust its marginal cost upward for all the leased workers while hiring an additional worker. Therefore, as the producing firm substitutes leased workers for directly hired workers, it faces higher leasing charges in this case, as shown in panel (a) of Figure 3.

In contrast, the leasing firm can grant a downward-sloping leasing rate schedule to its clients if an additional leased worker lowers nonwage acquisition costs more than that worker costs the leasing firm. Due to the advantage of economies of scale, the leasing firm reduces its marginal leasing cost to a level somewhere below the unit leasing charge; therefore, the leasing firm is willing and able to lower the leasing rate as it increases employee leasing with its clients. In panel (b) of Figure 3, a decrease in the producing firm’s direct hiring accompanies an increase in leasing at a lower unit leasing charge.

4. Efficiency Wage and the Demand for Direct Hiring

Efficiency-wage theories argue that higher pay can increase workers’ effort, build loyalty, reduce workforce turnover, and thus lower the cost associated with recruiting, training and
retaining workers, as summarized in Romer (2006). In an analytical approach similar to Romer’s generic efficiency-wage analysis, this section first derives the efficiency wage that the producing firm pays to directly hired workers and then turns to the consideration of the impact of labor leasing on the efficiency wage and demand for direct hiring.

Substituting (5) into (4) and manipulating the resulting equation produces the following result:

\[
\frac{e' \left(W^e, l\right) W^e}{e\left(W^e, l\right)} = \frac{W^e}{W^e + A}.
\]  

(7)

The wage rate determined by (7) represents the efficiency wage paid to directly hired workers, \(W^e\), as it minimizes labor cost of each efficiency unit, \((W^e + A)/[e(W^e, l)]\). The efficiency wage depends on the non-wage acquisition cost and the level of leasing employment in the same producing firm. Since not every dollar spent on recruiting a worker is the worker’s remuneration, the elasticity of effort associated with the unit cost of labor (inclusive of nonwage acquisition cost) must be lower than that when wage is an exclusive component of labor cost. In the presence of nonwage acquisition costs, the elasticity of a directly hired worker’s effort with respect to wage is less than one, as shown in (7). Therefore, the efficiency wage for directly hired workers in the presence of labor leasing exceeds its counterpart specified in the well-known Solow condition (see Solow, 1979), and the corresponding level of employment of directly hired workers is accordingly lower.

Differentiating (4) with respect to \(W\) and \(L\) and using (5) to simplify the result of differentiation generates an implicit demand function for directly hired workers, \(L^D = g(W; A, l)\), with the slope as

\[
\frac{\partial L^D}{\partial W} = -\frac{e' \left(W^e, l\right) L}{e\left(W^e, l\right)},
\]  

(8)

which states that the demand schedule for directly hired workers is downward sloping and higher wage reduces the number of directly hired workers demanded. Below are several findings from the comparative static analysis.

First, at any given level of direct hiring, the increased use of leased workers reduces the efficiency wage paid to the directly hired. Here, labor leasing acts as a “stick” that can substitute to a certain extent for the efficiency wage (“carrot”) in raising the moral and improving efforts of directly hired workers. This feature is spiritually the same as the shirking model in Shapiro and Stiglitz (1984), in which the unemployment rate helps induce workers effort and thus lowers the efficiency wage or loosens the no-shirking condition. Formally, differentiating (7) with respect to \(l\) and \(W^e\) produces
As discussed in Section 2, an increase in labor leasing reduces the wage’s “carrot” effect on the effort of directly hired workers; hence, $e''_{W}$ is negative and thus the numerator of the RHS in (9) is positive. As for the denominator with three differently signed terms, the sum of its last two terms can be expressed as (using (7)),

$$
\frac{1}{W^e + A} \left[ 1 - \frac{W^e}{W^e + A} \right] - \frac{A}{W^e + A},
$$

which is clearly negative. Given that the first term of the denominator of the RHS in (9) is negative, it follows that the entire expression of (9) is negative. Therefore, an increased leasing employment lowers the efficiency wage paid to directly hired workers, as labor leasing provides an alternative source of workforce to the producing firm. In this regard, our result is essentially consistent with the existing literature on the relationship between the relative wage and the rate of unemployment (see Summers, 1988, for example). However, unlike Summers (1988), the “stick effect” associated with unemployment in the present paper is endogenously derived from the firms’ optimization model with respect to employment through both leasing and hiring rather than given as an exogenous factor.

Next, for any given efficiency wage, the producing firm tends to substitute leased workers for directly hired workers if marginal productivity is sufficiently diminishing. Differentiating (4) with respect to $l$ and $L$ produces

$$
\frac{\partial L^D}{\partial l} = -1 \left( L e'_{l} + e'_{W} l + e \right) \frac{1}{e f',l} e_{e,l},
$$

where $e_{e,l}$ $(>0)$ is the elasticity of directly hired workers’ effort with respect to leasing employment, and $e_{f,l}$ $(<0)$ is the elasticity of marginal output with respect to leasing employment. Recall that a downward sloping marginal product of leased labor (MPPLL), or the producing firm’s demand schedule for leased workers, depends on sufficiently diminishing marginal productivity of leasing at a high level of leasing employment. The same condition, when applied to (10) above, implies a negative relationship between the leasing employment and the demand for direct hiring, that is, a substitution of leased labor for directly hired labor at a given efficiency wage. In fact, the efficiency wage identified in (7) represents a particular point on the implicit demand function for directly hired workers. At the given efficiency wage, the quantity of directly hired workers must adjust in response to any changes in the number of leased workers. Figure 4 depicts the producing firm’s linearized implicit demand for directly hired workers. As the demand for leased workers increases, the demand for direct hiring falls at the efficiency wage, and vice versa.

Finally, when there is an increase in non-wage acquisition costs, the demand schedule for
directly hired workers will shift to the left, that is,

\[
\frac{\partial L^D}{\partial A} = \frac{1}{[e^2(W, l)]f''[e(W, l) + e(l)][l] - 0. \\
\]

In this case, higher non-wage acquisition cost simply makes directly hired labor more expensive and therefore reduces the demand for it; in contrast, it places labor leasing at a strongly favourable comparative advantage in the labor market.

5. Conclusions

Employee leasing uses labor intermediation to provide an alternative form of employment. Firms opting for labor leasing arrangements mitigate the administrative burden of human resource management and rising costs of workers’ compensation insurance. In a framework that consists of both labor leasing and traditional direct hiring, this paper demonstrates that economies to scale grants the leasing firm and its client (producing firm) a comparative advantage in reducing non-wage acquisition costs relative to direct hiring. The analysis shows that, in the presence of non-wage acquisition costs, the efficiency wages paid to the directly hired workers is greater than the level that is consistent with the Solow condition; but the substitution of labor leasing for direct hiring lowers the efficiency wages, which broadly parallels with the result in Shapiro and Stiglitz (1984)’s shirking model. Furthermore, if economies of scale reduces the leasing rate more than a leasing firm’s monopsony power raises it, the resulting downward-sloping leasing rate makes an expanded employment through employee leasing non-inflationary. It follows that labor leasing actually can serve as a buffer against inflation during business expansions and economic growth.

Endnotes

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1. Smirnykh (2005) and Johnstone and Quinlan (2005) documented the recent evidence for labor leasing in industrialized countries.

2. As far as business perspectives are concerned, Traynor and Pesek (1987) provides some insights into employee leasing, particularly from a point of view of small businesses. Clinton (1997) documents rather robust evidence for the substitution of outsourced services for direct hire of permanent workers.

3. In his 1989 best seller, The Age of Unreason, Mr. Charles Handy, professor and business
consultant, depicted the picture of the “shamrock organization,” the company of the future that strive for reducing fixed labour costs. According to Handy, the first leaf of the shamrock portrays the core workers who are directly hired and have permanent commitment to the company, the second represents task contracted out to organizations that provide contracted services, and the third stands for flexible labor force. Employee-leasing arrangement is one form of the second leaf in Handy’s “shamrock organization” (See Handy, 1989).

4. In a study using data from the American Trucking Association and a survey of 223 major firms in the general freight segment of the U.S. trucking industry, Belzer (1995) analyzes the impact of the economic deregulation that began in 1977 on the restructuring of the U.S. trucking industry, concluding that deregulation had accelerated the deunionization and thus reduced the average wages of employees in the trucking industry.

5. Among many other interesting issues of labor leasing are the leased employees’ double moral hazard with the *de facto* “double-employer” situation, the link between workers’ performance in a firm where they work and their pay from the leasing firm, and asymmetric information in monitoring and reporting worker’s performance between the producing firm and the leasing firm, to name but a few.

6. Although $w(l)$ and $a(l)$ do not have to be strictly linear, an approximate linearity will guarantee the result in (2).

References


**Appendix**

Multiplying (2) by $l$ and then adding the resulting expression to (1) yields

$$r'(l)l + r(l) = 3[w'(l) + a'(l)]l + w(l) + a(l).$$

Taking derivative of (A1) produces the slope of the $r'(l)l + r(l)$ schedule: $4[w'(l) + a'(l)]$. Clearly, it is greater, in the absolute value, than the slope of the $r(l)$ schedule: $2[w'(l) + a'(l)]$, which appears in (2) of Section 2.
Figure 1 A Scheme of Labor Leasing and Direct Hiring

- **Leased workers**
  - **Wage & benefits**
  - **Entitlement to lease**

- **Leasing firm (Lessor)**
  - **Leasing fee**
  - **Performance supervising**

- **Manufacturing firm (Lessee)**
  - **Leased workers**
  - **Wage & benefits**

- **Directly hired workers**
  - **Wage & benefits**
  - **Performance supervising**
Figure 2a  Derivation of the Upward Sloping Leasing Rate Schedule
Figure 2b  Derivation of the Downward Sloping Leasing Rate Schedule

![Diagram showing the derivation of the downward sloping leasing rate schedule with various lines and points labeled.]
Figure 3  Impact on the Leasing Rate of Substitution of Leasing for Direct Hiring

- Panel (a)  \( r(l) \): Upward sloping

- Panel (b)  \( r(l) \): Downward sloping
Figure 4  Wage and Employment Effects of Leasing on Direct Hiring