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Labor Market Monopsony

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I. Introduction

There has been a renewed interest in monopsony in labor markets in recent years that includes both the traditional static approach to monopsony, ably reviewed by Boal and Ransom (1997), and the "new" approach to monopsony with more attention paid to dynamic issues, developed in detail by Manning (2003). The articles presented in this supplement highlight both approaches and illustrate the range of labor market settings in which the exercise of monopsony power may be important.

The first use of the term "monopsony" in economics is widely attributed to Robinson (1969).[1] Robinson conceived of monopsony as analogous to monopoly. Whereas monopoly refers to the case of a single seller confronted in a market by many buyers, monopsony refers to the case of a single buyer confronted in a market by many sellers. Just as the monopolist faces a downward-sloping demand curve for his product and

[1] Robinson attributes the term "monopsony," derived from ancient Greek, to B. L. Hallward of Peterhouse, Cambridge (see Robinson 1969, 215). Note that Robinson's classic book, *The Economics of Imperfect Competition*, was first published in 1933. The 1969 publication date refers to the second edition. Karatzas (2009) provides a detailed discussion of the word's origins.

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can set the price, the monopsonist faces an upward-sloping supply curve for the good being purchased and can set the price.

While the term "monopsony" does not refer specifically to the labor market, the labor market is the primary locus of work on monopsony. One reason for this is that it was recognized early on that a monopolist in the manufacture of a particular good would also be a monopsonist in the types of labor used only in the production of that good. Another early labor market example is the "company town," where a single employer dominates. Coal-mining communities in rural areas have this character.[2]

II. Static Models of Monopsony

In the simplest case of a competitive labor market, the employer is a wage taker and chooses employment to maximize profits:

$$\Pi = R(L) - WL, \tag{1}$$

where $R(L)$ is the firm's revenue function ($P \times Q(L)$ for a competitive firm), W is the wage rate, and L is the quantity of labor. The first-order condition for a maximum equates marginal revenue ($R'(L)$) with marginal cost (W) such that

$$R'(L) = W. \tag{2}$$

An employer with monopsony power also maximizes profits by equating marginal revenue and marginal cost, but the marginal cost of labor is greater than the wage in this case. The upward-sloping labor supply function implies that the wage is an increasing function of employment (the inverse supply curve). In this case,

$$\Pi = R(L) - W(L)L, \tag{3}$$

and the marginal cost of labor to the firm is $W'(L)L + W(L)$, which is strictly greater than the wage rate. The first-order condition for profit maximization in this case is

$$R'(L) = W'(L)L + W(L). \tag{4}$$

Given the usual assumption that the marginal revenue product of labor is declining in L, this implies that the employer with monopsony power

[2] There is literary support for such a characterization. The most famous may be *How Green Was My Valley*, a 1939 novel by Richard Llewellyn that was made into a film by John Ford in 1941. The book tells the story of a family in a Welsh coal-mining town. The film won five Academy Awards (and was nominated for five others). The story makes clear the power of the coal mine owner to set wages and working conditions.

will hire less labor and pay lower wages than the otherwise equivalent employer in a competitive labor market.

The first-order condition for a monopsonistic employer (eq. [4]) can be expressed as

$$\frac{R'(L) - W}{W} = \frac{1}{\varepsilon_{Nw}}, \tag{5}$$

where ε_{Nw} is the wage elasticity of labor supply facing the monopsonistic firm. This expression demonstrates the inverse relationship of the gap between the marginal revenue product of labor and the wage rate with the elasticity of labor supply. This gap has been termed the "rate of exploitation" (Pigou 1924; Hicks 1932). The competitive model is the limiting case in which ε_{Nw} approaches infinity.

Although not monopsony in the strictest sense, monopsony power can be exercised by any employer who faces an upward-sloping supply curve for labor. A single employer in a nominally competitive labor market can have monopsony power over his current workforce if workers bear a cost of job change, pecuniary or nonpecuniary.[3]

In this case, the wage paid to existing workers may be lower than the wage required to hire reasonable numbers of new workers. For example, a firm may be paying its existing 1,000 workers $10 per hour, but the competitive market wage to hire new workers is $11 per hour. It is entirely possible that the marginal revenue product of labor is greater than $11 per hour (say $12), but the firm will not be willing to hire more workers if it has to pay all workers the same wage. In this example, the marginal cost of hiring an additional worker is $1,011 ($11 for the new worker, and $1 for each of the 1,000 existing workers). This clearly dwarfs the marginal revenue product of $12 per hour.

The existence of monopsony power raises the possibility that institutions that raise wages (e.g., labor unions or minimum wage legislation) can, in fact, increase employment. Consider, for example, a labor union that has organized the firm described in the previous paragraph with monopsony power over its workers. Suppose this union is able to negotiate a wage of $11.50. The firm will pay the higher wage and hire more workers. This is because the marginal cost of labor in the relevant range is now $11.50, while the value of the marginal product of labor remains at $12. The key is that the firm has to pay the higher wage to its existing workers, regardless of whether it hires more workers. The wage increase for existing workers is not a marginal cost. An increase in the minimum wage works in precisely the same way, and this monopsony model is one of the possibilities raised by Card and Krueger (1995) in their work that

[3] This notion of monopsony power in which there are many firms that hire workers flows naturally from the new dynamic models of monopsony.

finds no (or even a positive) effect of an increase in the minimum wage on employment.

The static framework leads directly to a natural "test" for monopsony based on estimating the elasticity of labor supply. Indeed, two of the articles in this conference issue take precisely the approach of measuring monopsony power by estimating the elasticity of labor supply in a static model: Falch (2010) and Staiger, Spetz, and Phibbs (2010). Falch (2010) estimates the elasticity of teacher labor supply to individual schools in Norway to be about 1.5. Staiger et al. (2010) estimate the elasticity of labor supply of nurses to U.S. Veterans Administration hospitals to be 0.1. These estimates are all very small and suggest considerable monopsony power in a variety of settings, and they imply a considerable degree of "exploitation" (eq. [5]) in the form of wages well below the value of the marginal product.

III. Dynamic Models of Monopsony

One of the most interesting recent developments in the analysis of labor market monopsony is the study of dynamic models of the sort proposed in the recent book by Manning (2003). In these models, firms have some wage-setting power, even in the presence of many competitors, due to imperfect information (perhaps from search frictions) or high levels of differentiation. The basic notion is that the firm's employment represents an equilibrium between the flow of workers who leave and those who join the firm and that these flows are determined by the wage that the firm chooses.

The size of the firm at time t is defined in terms of employment, N_t, with a separation rate of $s(w_t)$ and a recruitment function $R(w_t)$. The firm's size in the next period will be

$$N_t = [1 - s(w_t)]N_{t-1} + R(w_t). \tag{6}$$

It follows that in a steady state,

$$s(w)N(w) = R(w), \tag{7}$$

or

$$N(w) = \frac{R(w)}{s(w)}. \tag{8}$$

In elasticity terms, this dynamic labor supply function can be written as

$$\varepsilon_{Nw} = \varepsilon_{Rw} - \varepsilon_{sw}, \tag{9}$$

so the elasticity of labor supply to the firm can be inferred from observations on the sensitivity of quit rate and recruits to the wage. To simplify things even more, Manning (2003, 97; 2009) provides justification for the

idea that the recruitment elasticity is just the negative of the separation rate elasticity. (The intuition is that by raising the wage slightly, an employer lures away some employees who otherwise would have stayed with a competitor, so one employer's recruit is another employer's separation.) These estimates represent long-run elasticities, as they are based on an equilibrium condition.

Thus, the elasticity of labor supply to the firm is simply twice the firm's elasticity of the quit rate with respect to the wage. The quit rate elasticity is a concept that is quite easy to estimate; indeed, there is a long literature in economics that examines the question, as in Parsons (1972) and Pencavel (1972). The issue has also been studied in other fields, as in the survey by Hom and Griffeth (1995) from management.

This issue contains three studies that adopt the Manning approach of estimating the elasticity of the separation rate with respect to the wage: Hirsch, Schank, and Schnabel (2010); Ransom and Oaxaca (2010); and Ransom and Sims (2010). The Hirsch et al. (2010) article examines a large linked employer-employee data set from Germany. They compare individuals across a wide range of jobs and employers. They find estimates of the average elasticity of labor supply to the firm in the range of 2–4. Ransom and Sims (2010) study a specific market: public schoolteachers in Missouri. Their preferred estimate of the elasticity of labor supply is 3.7, using negotiated salary schedules as instrumental variables for actual wages. Ransom and Oaxaca (2010) are even more specific: they analyze data from a single employer, comparing separation rates and wages across different job titles. Their estimates range from about 1.5 to 2 for women and from 2.5 to 3 for men.

These estimates are all quite small, suggesting significant levels of market power for employers, especially as they are interpreted as long-run elasticities. Is there something about this approach that biases the estimated elasticities downward? Or is the labor market really characterized by this level of monopsony? One obvious criticism, as pointed out by Manning (2009), is the potential for omitted variables in the separations' regressions. For example, in the Ransom/Sims analysis, if the higher wages of some school districts represent compensating differences for difficult working conditions (as in tough urban schools), then the apparent differences in wages are greater than the real differences, and the estimated elasticities will be too small. However, this does not necessarily argue for downward-biased estimates—the higher-wage jobs typically have better benefits, for example.

Two other articles in this issue also adopt a dynamic monopsony approach, although they do not attempt to estimate an elasticity of labor supply directly. Fox (2010) develops a structural model of interfirm mobility for engineers in Sweden and estimates this model using a data set that allows him to track the careers of most engineers in Sweden from

1970 to 1990. He finds that the majority of experienced engineers behave as if they face large costs of switching employers. In other words, interfirm mobility is quite insensitive to wage differences across employers.

Naidu (2010) examines an institution in southern U.S. states in the postbellum period—anti-enticement laws. These laws imposed criminal fines on planters who attempted to recruit sharecroppers who already held a contract with another employer. By examining differences over time and between states, he finds that such laws were indeed effective in reducing competition between potential employers and that this reduction in competition had the expected effect—less worker mobility and lower wages for black farm workers.

IV. Public Policy and Monopsony

The remarkable common feature of all the studies reported here is the high "monopsony power" implied by the firm-level estimates of labor supply. For example, Falch's (2010) estimate of the elasticity of supply of schoolteachers in Norway implies that a government selecting an optimal hiring strategy would result in wage rates that are marked down about (from eq. [5]) 65% from a teacher's marginal value. The estimates reported for nurses by Staiger et al. (2010) imply much greater markdowns of wage rates from marginal valuations. In general, if exploited by employers, such high rates of monopsony power imply large welfare losses to society through the misallocation of labor and considerable redistribution of income away from workers and to residual claimants.

Whether such welfare losses are experienced is determined by the extent to which firms and governments exploit their monopsony power—that is, whether these agents maximize profits or minimize costs. To determine whether this occurs, it is necessary to look at other indicators of behavior. Since the presence of monopsony implies that wage rates are not equated to marginal products, one place to look for other evidence is in employer recruiting behavior and in the use of wage discrimination to take advantage of differential supply responses. For example, chronic concerns over "shortages" are an indicator that firms are exploiting their monopsony power, as are wage discrimination systems that pay lower wages to full-time than to part-time or contract workers.

George Priest's (2010) article provides a detailed dissection of one such symptom of monopsonistic exploitation: the use of nonwage mechanisms, such as forced matching programs, for the allocation of workers. Once worker wages are removed from competition, it is inevitable, as Priest shows, that other forms of compensation will play a larger role in worker allocation. Such mechanisms are not the cause of monopsony, but rather they are the result of it, and they provide direct evidence that agents are exploiting their monopsony power.

The results of the articles presented here raise two broader questions: (1) how substantial is the evidence of monopsonistic practices, and (2) what public policies are there to address monopsony and its allocative distortions? The first question is aimed at the extent to which these results represent behavior that is more generally observed in the labor market. Although there is considerable anecdotal evidence that the behavior studied here is far from universal, these studies represent a considerable cross-section of employers, which suggests that the allocative problems associated with monopsonistic exploitation are far from trivial.

As to the second question, the historic, textbook remedy for monopsony is the promotion of some device that induces an observably highly elastic supply of labor to the relevant firm(s). Minimum wage laws and unionization may be justified as institutions that provide just such remedies. Alternative remedies might rely on the antitrust laws. Providing further analysis of both the extent of monopsonistic exploitation and its effects would be useful for shedding more light on these issues.

The articles in this issue provide remarkable evidence that labor markets are far from competitive. The evidence comes from a variety of countries and labor markets using a variety of econometric techniques and models. We hope that the studies published in this volume will provide a basis and an impetus for further empirical study of imperfections in labor markets.

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