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Who Set *Your* Wage?[†]

By David Card*

I discuss the recent literature that has led to new interest in the idea of monopsonistic wage setting. Building on advances in search theory and in models of differentiated products, researchers have used a number of different strategies to identify the elasticity of firm-specific labor supply. A growing consensus is that firms have some wage-setting power, though many questions remain about the sources of that power. (*JEL* B21, D21, D24, D43, J22, J31, J42)

In the textbook model of labor markets—synthesized by Hicks (1932)—product and factor markets are perfectly competitive and wages are equated to marginal products.[1] Just one year after Hicks, Robinson (1933) developed an alternative framework for understanding firm-specific wage setting and coined the term "monopsony." The book attracted a lot of attention, and at least some labor economists were enthusiastic. Reynolds (1946, p. 390) wrote that the concept of an upward-sloping supply curve of labor to the firm "… has made its way rapidly into the textbooks and seems well on its way to being generally accepted as a substitute for the horizontal supply curve of earlier days." But Reynolds's prediction was premature. By the 1960s the concept of monopsony had been relegated to discussions of company towns. Indeed, in the preface to the second edition to her book, Robinson (1969) observed, "All this had no effect. Perfect competition, supply and demand … and marginal products still reign supreme in orthodox teaching."

At the risk of following too closely in Reynolds's footsteps, in this paper I will try to make the case that the time has come to recognize that many—or even most—firms have some wage-setting power. Such a shift was made with respect to firm's *price-setting* power many decades ago. Economists now routinely accept that the prices of products like gasoline, breakfast cereal, and ketchup are set with some degree of market power, even in online markets. In the past few years we may have reached a tipping point for a similar transition in labor economics, driven by the combination of new (or at least post-1930) theoretical perspectives, newly available data sources, and accumulating evidence on several different fronts.

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[1] Hicks (1932) also introduced the elasticity of substitution between labor and capital and corrected an error in "Marshall's rules" describing the industry-level elasticity of labor demand.

I. A Brief History: 1932–1970

In the final chapter of her book, Robinson (1933) laid out a model of a firm with a combination of price-setting and wage-setting power, and showed that the result was a "double wedge" between marginal productivity and wages, reflecting the *markup* of prices over marginal costs and the *markdown* of wages relative to value marginal products.[2] Why didn't this idea catch on?

I think there are several explanations. The first is that her framework describes "perfect" monopoly and "perfect" monopsony. She offers very little guidance on intermediate levels of market imperfection in either market, and says nothing about the interactions between competing firms in such intermediate cases—a criticism raised in the early review by Kaldor (1934) and freely acknowledged by Robinson herself (Robinson 1953).[3]

A second and related reason is that the simple geometric apparatus developed by Robinson (and also used by Chamberlain in his book published in the same year) was not very useful for further analytical exercises. Stigler (1949) made this point forcefully with respect to Chamberlain's theory of monopolistic competition, arguing "… it has not been useful in the concrete analysis of economic problems, in the sense that it does not contain more accurate or more comprehensive implications than neoclassical theory." The importance of a tractable framework is underscored by the *current* status of Chamberlain's idea. Once Spence (1976) and Dixit and Stiglitz (1977) wrote down constant-elasticity-of-substitution (CES) style models models of consumer demand, and showed how to embed those preferences in a general equilibrium setting, monopolistic competition took off, and is now a workhorse model for problems in macroeconomics, international trade, and economic geography (see Brakman and Heijdra 2004).

A third explanation is that in simple monopsony models, firms are ready and willing to hire any qualified worker who is willing to accept their offered wage. Indeed, a monopsonistic firm is always starved for labor. Proposing such a model in the depths of the Great Depression was not ideal timing for Robinson. In contrast, in today's economy the idea of labor-starved firms is more attractive.

Fourth, the question of *how* wages and prices are set got caught up in the grand ideological debate over alternative economic systems that occupied many minds during the twentieth century. Robinson rather dogmatically insisted that any divergence between marginal products and wages represented a failure of market capitalism. Chamberlain, for his part, spent many years defending the welfare properties of monopolistic competition (e.g., Chamberlain, 1950). Throughout the 1930s and into the Cold War era, economists were more interested in arguing about (often ill-posed) normative questions than in understanding the positive implications of alternative models of wage and price setting. In this context, Arthur Pigou's labeling of the gap between marginal productivity and wages as an index of "exploitation"

[2] Specifically, on page 315 she noted that the gap between wages and marginal products will be equal to $\frac{\epsilon-1}{\epsilon} \times \frac{E}{1+E}$ where ϵ is the elasticity of demand for the firm's output and E is the elasticity of supply to the firm.

[3] Of course satisfactory models of the strategic interactions between agents were not fully developed anywhere in economics until the late 1970s.

was clearly unfortunate. And Robinson's public persona as a hard-left polemicist (Aslanbeigui and Oakes 2009) did not help.

For these and perhaps other reasons,[4] by the 1970s the standard graduate-level textbooks in microeconomics theory (e.g., Malinvaud 1972) chose to give only a brief discussion of market power in output markets, and to complete ignore monopsony. Students of that generation had heard of imperfect competition and market power in their *undergraduate* courses, but had almost no formal training in the analytics of such models.

II. New Theoretical Frameworks

Early analysts (including Robinson and Reynolds) recognized two alternative explanations for a less-than-perfectly elastic supply of labor to a given firm: information frictions and idiosyncratic preferences for different jobs. New models of optimal search and of the demand for differentiated products that were developed in the 1970s provided the foundations to formalize these explanations.

A. *Search Models*

Research in the late 1960s (including McCall 1970 and Mortensen 1970) led to an elegant theory of optimal search by unemployed workers faced with an exogenous distribution of potential wage offers. Almost immediately, Diamond (1971) and Rothschild (1973) noted difficulties with endogenizing the wage offer distribution in this setting. To sidestep this problem, much of the subsequent literature has followed the lead of Diamond (1982); Mortensen (1982); and Pissarides (1985) and switched to a model of search over *job match quality* (see Pissarides 2010). Since wages have no allocative role in such models, they are not particularly helpful for analyzing wage-setting power. The canonical status of these models may have also led to an overemphasis on the importance of match effects in wage determination and labor market dynamics.

An alternative approach, developed by Burdett (1978) and Burdett and Mortensen (1998) (hereafter BM) is to assume that employed workers also search for better opportunities. On-the-job search is empirically important; it also counters an employer's temptation to reduce wages for unemployed job seekers to the bare minimum. BM consider a world where each firm posts a single wage, and can recruit workers either from unemployment or lower-paying firms. As Manning (1994, 2003) showed, such a "job ladder" model offers many insights into the links between worker turnover and wages. It also provides a simple framework for thinking about the degree of market power of any single employer. Postel Vinay and Robin (2002) generalized BM by allowing firms to (perfectly) price discriminate against different workers, depending on their preceding job and any job offers so far. This sequential auction framework creates a more complex relationship between firm mobility and

[4] Robinson's gender may also have been an issue. Card et al. (2022) develop models of the probability that economists were elected as fellows of the Econometric Society which depend on past publications and citations. Their analysis suggests that prior to 1980 females as a whole were significantly less likely to be recognized as fellows than males with the same record.

wages (see Di Addario et al. forthcoming for a simple exposition focusing on starting wages for each job).

B. *Differentiated Demand Models*

Chamberlain (1933) considered a model in which firms produce a differentiated set of products and set prices ignoring strategic interactions with other producers. This model translates directly to the supply side,[5] though to the best of my knowledge Bhaskar and To (1999) were the first to try to formalize the idea of monopsonistic competition. Chamberlain's simple graphical analysis was reproduced in many undergraduate textbooks, but (as noted above) had a limited impact on subsequent research until Spence (1976) and Dixit and Stiglitz (1977) wrote down CES-style models of representative agent preferences that rationalized his framework. Models based on these preferences (and generalizations with a nested CES structure) have proven amenable to a multitude of applications in different fields. Recently, Berger, Herkenhoff, and Mongey (2021) have adapted the approach to the study of wage setting.

An alternative approach to modeling demand for differentiated products is the multinomial logit (MNL) model proposed by McFadden (1974, 1978). The MNL and its generalizations specify *individual-level* preferences that lead to convenient expressions for the share of consumers that purchase each product (Berry 1994), and are widely used in industrial organization (IO) and labor economics. Card et al. (2018) proposed the use of MNL style preferences to model the dispersion in tastes for different workplaces. If employers ignore strategic interactions in wage setting, their setup leads to very simple expressions for the supply of labor to individual firms which can be used to rationalize the firm effects in a model like that of Abowd, Kramarz, and Margolis (1999). Azar, Berry, and Marinescu (2019) adapt this approach (with nested MNL preferences) to model the supply of applicants to different job openings. Likewise, Lamadon, Mogstad, and Setlzer (2022) use a nested MNL specification to model the supply of workers to individual firms.

While the "representative agent CES" approach and the "individual level MNL" approach might appear to be very different ways of modeling consumer demand (or labor supply), Anderson, de Palma, and Thisse (1978) and Verboven (1996) showed that at the market level they are isomorphic (subject to functional form choices about the terms in the CES function and the indirect utility function in the MNL).[6] This isomorphism is extremely convenient and in principal allows analysts to proceed with either approach, and build on advances that have been made in the two literatures.

[5] For example, one can draw an s-s curve showing the supply curve to a firm if its competitor's wages are held constant, and an S-S curve showing the supply curve when all their wages shift together (as might happen with a rise in the minimum wage, for example). The latter will be less elastic than the former (and could even be vertical).

[6] For example, Verboven (1996, Proposition 2) shows that the demand functions from a nested CES representative consumer model are the same as those derived from a nested MNL logit individual-level model where indirect utility depends on the log of the price of the specific option chosen.

III. Empirical Evidence in the First Three Decades of Modern Labor Economics: 1965–1995

"Modern" labor economics began in the mid-1960s with the release of individual microdata from the 1960 census (e.g., Cain 1966; Hanoch 1967; Bowen and Finegan 1969), the Survey of Consumer Finances (e.g., Stafford 1968) and the Survey of Economic Opportunity (e.g., Ashenfelter 1972). As noted by Stafford (1986), these new datasets, along with cross-sectional microdata from the Current Population Surveys and longitudinal data from the Panel Study of Income Dynamics and the National Longitudinal Surveys, propelled research in the field for the next few decades and shaped our current understanding of the labor market.

Considerations of employer wage setting played little role in this stream of research. One reason for this was the influence of economists at the University of Chicago, who were at the forefront of the new "analytical" labor economics (Rees 1976), and strongly advocated for neoclassical modeling. Even more importantly, the newly available micro datasets had almost no information on *employers*. Thus, it was extremely convenient to frame the analysis in the setting described by Hicks (1932), where individual employers are irrelevant.

There were a couple of exceptions to this general rule. One was the analysis of wage setting under collective bargaining. Here, most analysts followed Lewis (1963) in modeling a unionized *sector* where wages were pushed above the competitive level, and a nonunion sector where wages were determined under perfect competition. There was little attention to the role of firm-specific factors, apart from a small literature based on wage contracts (e.g., Hamermesh 1970; Riddell 1979; Christofides, Swidinsky, and Wilton 1980) that eventually turned to the question of how employment and wages are *jointly* determined under collective bargaining (e.g., Brown and Ashenfelter 1986; Card 1986, 1990).

A second exception was the literature on quits, turnover, and the returns to seniority. Pencavel (1972) and Parsons (1972) presented multi-period models of employer wage setting with a trade-off between wages and quit rates—foreshadowing the dynamic monopsony literature discussed below. While the wage-setting equations in these papers are clearly interpretable in a monopsony framework, neither author acknowledged any connection with Robinson, or noted that in a perfectly competitive labor market the quit rate should rise to 100 percent if the wage is set below the "market" rate.

A problem faced by both papers was the confusion surrounding Becker's (1962) analysis of firm-specific human capital, which addressed what we now call the problem of "relationship-specific investments."[7] Many labor economists interpreted Becker as saying that firms choose wages to reduce quits (e.g., Parsons 1972 and Hashimoto 1981) assuming that quits are a smooth function of wages. This is equivalent to monopsonistic wage setting.[8]

[7] Crawford (1988) presents an elegant reformulation of Becker that clarifies the issues using modern terminology. See also MacLeod and Malcomson (1993).

[8] See Manning (2003) for more discussion. Donaldson and Eaton (1976) also noted some of the problems with a simple interpretation of Becker's model of wage setting with relationship investments.

In addressing the closely related problem of optimal turnover in a model with a *fixed* (but unknown) match component, Jovanovich (1979) showed that an equilibrium contract pays the worker the expected value of her match-specific productivity, and allows her to quit when the option value of the current job falls below the option value of a fresh job.[9] Jovanovich's model has features of the canonical Diamond-Mortensen-Pissarides search model, but incorporates job-to-job mobility, leading to something like a "worker-specific job ladder" as jobs that are revealed to be worse matches (and therefore have lower pay) are terminated.[10] Topel and Ward (1992) interpreted the patterns of wages and turnover for young male workers as evidence of this process, but they did not have rich enough data to tell whether wages include a match-specific component (as in Jovanovich 1979) or whether later-career jobs pay higher wages to *all* workers (as in the BM model). In my view, the simple event studies developed by Card, Heining, and Kline (2013) and the surprisingly small job match component uncovered in that paper (and many later studies) suggest that workers tend to move up the same job ladder (as in Abowd, Kramarz, and Margolis 1999).

Finally, there were a few studies of specific institutional settings where firm wage setting power seemed possible. Sullivan (1989), for example, showed that increases in the number of nurses were correlated with hospital-specific wage increases, suggesting that employers were facing upward-sloping supply curves for nursing labor. Ransom (1993) used university payroll data to show that wages of professors decline with tenure—a pattern he attributed to monopsonistic wage discrimination.

IV. What Happened in the 1990s?

Four new types of evidence have accumulated in the past 25 years that suggest employer wage-setting power is nonnegligible: evidence on quit and recruiting responses to wages, evidence on the relationship between wages and firm productivity, evidence on the concentration of employment in small numbers of employers, and evidence of conspiracies and other forms of firm behavior targeted at suppressing firm-to-firm mobility and wage growth.

A. *Quit*, *Recruiting*, *and Application Elasticities*

Though many economists acknowledge that quit and recruitment rates vary with wages, the connection between these responses and the elasticity of supply that is relevant for a monopsonistic wage setter does not seem to have been fully appreciated until the seminal paper by BM (which circulated for many years prior to its publication). Card and Krueger (1995) noted that in any steady state, the elasticity of labor supply is just the sum of the absolute values of the elasticities of recruiting and quitting. Manning (2003) showed that in a simple job ladder model the two are equal: thus, an analyst can estimate one or the other and double it to yield

[9] If match-specific productivity requires upfront investment, the solution is to have workers pay for the investment and then follow the Jovanovich rule. This is solution proposed by Crawford (1988). Discussions of such "bonding" contracts were widespread when I joined the Chicago faculty in 1982.

[10] Subsequent studies by Miller (1984) and McCall (1990) used the multi-arm bandit setup of Gittins and Jones (1974) to incorporate learning over an occupation-specific match component as well as a job-specific component.

an estimate of the overall supply elasticity. Manning's insight provides a tractable method of estimating labor supply elasticities that has been implemented in many different settings.

Perhaps the most compelling evidence based on this approach comes from the experiment on public sector hiring conducted by Dal Bo, Finan, and Rossi (2013). These authors randomly varied the salaries announced at different job sites to potential job applicants for a position in the office of the Regional Development Program in Mexico. Taking account of the combined impact of higher wages on application rates and on the probability of accepting a job, they calculate that the elasticity of recruiting with respect to wages is around 2.1 (though rather imprecisely estimated). Using Manning's shortcut, the implied (steady state) elasticity of labor supply is around 4.2.[11] In a simple monopsonistic model such an elasticity implies that wages are marked down relative to marginal revenue products by about 20 percent.

Observational studies of the partial correlation between wages and quit or recruiting rates tend to yield elasticities in the same range (see Sokolova and Sorensen, 2021 for a meta-analysis of this literature and Ashenfelter et al. forthcoming for an overview of a studies published in a recent issue of the *Journal of Human Resources*). For example, Bassier, Dube, and Naidu (2021) study job ending rates of workers using administrative data from the State of Oregon, and estimate elasticities in the range of -1 to -2.5, with a preferred point estimate of -2.1, implying a steady state labor supply elasticity of 4.2. Azar, Berry, and Marinescu (2019) use data from a large online job posting service to study the application choices of job searchers. Adopting the estimation approach of Berry, Levinsohn, and Pakes (2004) (and using instrumental variables for posted wages) they infer that the firm-specific elasticity of applications with respect to wages is around 2.9. Assuming the recruiting elasticity is the same as the application elasticity this implies a steady state labor supply elasticity of just under six.

B. *The Relationship between Wages and Firm Productivity*

In a competitive labor market, more and less productive firms pay the same wages for workers, even if the more productive firms are larger. In imperfectly competitive labor markets, however, more productive firms will generally have to pay more to maintain a larger workforce. Card et al. (2018) developed a simple partial equilibrium model where workers have MNL preferences over different firms and firms set wages without accounting for strategic interaction effects (i.e., a model of monopsonistic competition). They then calibrated the model to (roughly) match the observed degree of pass-through from value added per worker to wages. In the existing literature researchers typically find that wages are about 0.5 to 1.5 percent higher at firms with 10 percent higher productivity. In the parameterization of preferences adopted by Card et al., this degree of pass-through is consistent with firm-specific supply elasticities of about four.

Lamadon, Mogstad, and Setlzer (2022) present a more extensive analysis of the pass-through of firm-specific and market-wide value added per worker to

[11] They also find that higher wages leads to an increase in the quality of successfully recruited applicants, as measured by scores on IQ and personality tests.

firm-specific wages and interpret the effect in a model of monopsonistic competition with nested MNL preferences over firms and markets. Their estimate of the parameter determining the elasticity of supply to each firm is five, broadly consistent with the calibration by Card et al. and with the evidence from quit and recruiting elasticities.

A related method of estimating the degree of wage-setting power is to look at establishment-level responses of employment and wages to an exogenous shock (similar to the pioneering study by Sullivan 1989). Berger, Herkenhoff, and Mongey (2021) uses evidence on firm-specific reactions to state tax changes to infer the degree of oligopsony power in a setting with strategic interactions among wage setters (based on Atkeson and Burstein 2008). They estimate that the average markdown of wages relative to marginal revenue products is around 25 percent (equivalent to the markdown in a simple monopsonistically competitive model with firm-specific elasticities of around 3.5). Kroft et al. (2020) extend the setup in Lamadon, Mogstad, and Setlzer (2022) using information on successful bids in government procurement auctions as firm-specific demand shocks that affect employment and wages at larger construction firms. They estimate labor supply elasticities in the range of four to five.

C. *The Number of Competitors for Labor Services*

In thinking about price-setting or wage-setting power many economists turn instinctively to the question of how many potential sellers or buyers are present in a market, or to the degree of market concentration measured by the Herfindahl-Hirschman index (HHI). As noted by Berry, Gaynor, and Scott Morton (2019); Syverson (2019); and Eeckhout (2021), simple measures of the number of competitors or their concentration do not necessarily provide a clear index of market power. Nevertheless, a common perception (among judges for example) is that the number of potential employers for any given worker is large, and that the market power of employers is therefore negligible.[12]

One of the most surprising findings in the recent literature is that for many workers in many local markets the number of potential employers is relatively small, particularly when the "market" is defined by actively searching firms.[13] Azar et al. (2020), for example, use data on the near universe of US vacancy listings to calculate HHIs for labor markets at the narrowly defined occupation-by-commuting zone (CZ) level. They estimate that an average labor market has an HHI of around 4300—equivalent to 2.3 equal sized recruiting firms. This is low enough to possibly raise concerns about the effect of mergers and acquisitions on labor outcomes (see Naidu and Posner 2021).

A growing number of papers study the relationship between average wages for a specific subgroup of workers in a given local market and the HHI of potential employers in that market. These studies differ in how they define the set of

[12] Models based on search (which typically have a continuum of employers) illustrate the fallacy of this conclusion, as do models of monopolistic or monopsonistic competition.

[13] Of course some workers move across geographic regions (see, e.g., Card, Rothstein, and Yi 2021) but for many jobs a local perspective may be reasonable. The issue of within- versus between-market competition is handled nicely in a nested logit framework like that used by Azar, Berry, and Marinescu (2019).

potential employers (based on industry or occupation), how they count employment (based on the stock of employment, the number of job openings, or some transition-probability-adjusted stock of employment), and whether they use a purely observational approach, or implement a research design that isolates some exogenous component of the local HHI. Despite these differences, most recent studies seem to show a negative effect of higher concentration on wages, with elasticities between the HHI and wages on the order of -0.05 to -0.15.

For example, Azar, Marinescu, and Steinbaum (2022) use data from a large national employment website to study the relationship between posted wages for jobs in a given occupation and CZ and the HHI of employers listing vacancies in that occupation and location. They find smaller elasticities of posted wages with respect to the HHI in simple ordinary least squares (OLS) models, but larger elasticities when they instrument the HHI with the leave-out mean number of competitors searching for workers in that same occupation in other markets. Rinz (2020) estimates HHIs from counts of establishment-level employment by CZ and industry, then relates these to administrative earnings from tax data. In OLS models he finds that wages are slightly higher in more concentrated markets, but in models that use the leave-out mean of the HHI for the same industry in other locations as an instrumental variable, he obtains negative elasticities in the range of Azar, Marinescu, and Steinbaum (2022).

Recent studies by Arnold (2020) and Prager and Schmidt (2021) use event study designs to look at the effects of merger and acquisition activity on local HHIs and wages. In my opinion, these designs provide the best available evidence that employer consolidations that raise the HHI have significant negative effects on wages, at least for workers who are highly attached to the affected industry.[14]

D. *Conspiracies and Other Arrangements to Suppress Competition*

Adam Smith (2003, p.94-95) wrote that employers "are always and everywhere in a sort of tacit, but constant and uniform combination, not to raise the wages of labor above their actual rate."[15] He also noted, however, that "(w)e seldom, indeed, hear of this combination, because it is the usual, and one may say, the natural state of things, which nobody ever hears of." While discoveries of employer collusion are still relatively rare, in the past two decades there have been a number of lawsuits and public disclosures that provide the details of some agreements to suppress competition. These provide a useful perspective on the mechanisms generating market power for employers.

The best-known lawsuit concerned "no poaching" and "no solicitation" agreements affecting software and animation engineers in Silicon Valley (see Ashenfelter et al. forthcoming for more details).[16] The agreement originated in the mid-1980s when Lucasfilm sold its computer animation division to Steve Jobs, who then

[14] A third study by Benmelech, Bergman, and Kim (2020) uses mergers and acquisitions as instrumental variables for the HHI and reaches the same conclusion.

[15] Alan Krueger provided a new introduction for an edition of *The Wealth of Nations* (Smith 2003) and highlighted this quote. It is also used by Ashenfelter and Krueger (2021).

[16] Judge Lucy Koh's order granting class certification of the case (Northern District of California, Case 5:11-cv-02509-LHK) provides much detail on this case.

renamed the company "Pixar." To avoid bidding wars over employees, Lucasfilm and Pixar agreed (i) not to "cold call" each other's employees; (ii) to notify the other company should they receive an application for employment; (iii) and that all offers to employees at the other company would be "final," with no further bidding. Ultimately this agreement was extended to other high-tech firms (e.g., Google, Microsoft, and Oracle) and lasted over 20 years, until 2008.

The size of the settlement to affected engineers ($585 million in two suits), and other wage adjustments made after the agreement was made public (e.g., a 10 percent across-the-board increase offered by Google to *all* its employees in November 2010) suggest that the suppression of between-firm competition was successful—a validation of the idea that at least some labor markets are vulnerable to wage fixing.

Another interesting lawsuit concerned a "no hire" agreement between the medical schools at Duke University and University of North Carolina (*Seaman v. Duke*). This case, which resulted in a settlement of around $10,000 for each member of the medical faculties at the two schools, reveals how localized competition appears to matter, even for workers who arguably face a national market.

While one might be tempted to think that "no hire" and "no poaching" agreements affect only highly skilled workers, Ashenfelter and Krueger (2021) found that no poaching clauses were widespread in US franchise agreements.[17] These agreements typically prohibit a franchisee from hiring another franchisee's employees for some prespecified period of time after an employee's departure. For example, a standard franchise agreement for McDonald's as of 2016 had a clause stating: "Franchisee shall not employ or seek to employ any person who is at the time employed by McDonald's, any of its subsidiaries … or otherwise induce, directly or indirectly, such person to leave such employment" (quoted in Ashenfelter and Krueger 2021). The prohibition extended to employees for six months after leaving another McDonald's job.

Another strand of recent research has focused on the prevalence of noncompete agreements, which prohibit employees from moving to jobs at "competitor" firms for a specified period (e.g., Starr 2019; Balasubramanian et al. 2020). Again, a surprising fact is the prevalence of these agreements even for relatively low-wage workers. Recently, however, a number of states have enacted legislation that prohibits noncompete agreements for "low-wage" workers (e.g., earning less than $100,000 per year in Washington State—see Goldstein and Oberlander 2021).

The popularity of no-poaching and noncompete agreements seems to confirm the basic insights of a BM-style job ladder model. Since the quit rate in such models depends in part on the rate at which workers obtain offers at other employers, limits on poaching or firm-to-firm mobility will reduce quits and increase monopsonistic power.

V. An Agenda for the Future

It is presumptuous for anyone to try to influence the direction of research in a large and fractious field like labor economics. Nevertheless I have two suggestions

[17] Subsequent to the circulation of Ashenfelter and Krueger's paper the Attorney General of the State of Washington took action to outlaw such contracts, and it appears that they are being eliminated in many contracts.

for where I see the most exciting possibilities for progress: more and better models; and a sustained effort to move the entire topic of wage setting into the hands of (labor) economists.

A. *Models*

There are two main approaches to modeling the factors that generate upward-sloping supply curves: search frictions (which Manning 2021 calls the "new monopsony") and idiosyncratic preferences for jobs (which Manning calls the "new classical monopsony"). Both approaches have some strengths and some weaknesses. The search approach directly addresses turnover, which is a key feature of labor markets and appears to be the main mechanism for between-firm competition. Models with on-the-job search also create a job ladder, which is a very useful construct for understanding the costs of job displacement and the effects of recessions (e.g., Altonji, Smith, and Vidangos 2013; Moscarini and Postel-Vinay 2018).

But the lack of information presumed in a typical posted wage search model is troubling. There is plenty of evidence that most workers know about at least *some* higher-paying jobs. (Everyone at Berkeley knows that salaries are higher at Stanford, for instance). Firms' positions on the wage ladder are relatively stable, so it seems possible to learn about opportunities through referrals (Caldwell and Harmon 2019) or other channels. And if the number of potential employers for a typical worker is a low as recent research suggests, it's hard to imagine that workers aren't aware of many of the relevant opportunities.

Models based on idiosyncratic preferences, on the other hand, ignore imperfect information but assume that most people simply *don't want* another job, even if it pays more. On the positive side, these models build directly on established frameworks from IO and trade: the accumulated experience in those fields will be very helpful, particularly in addressing strategic interactions between wage setters (as in Berger, Herkenhoff, and Mongey 2021). On the negative side, there is no job ladder or any particular cost of losing the current job: everyone is employed at their best option, given the wage and nonwage amenities offered by different employers. Employers are starving for workers, but are nonetheless setting wages below marginal revenue products to capture some of the surplus from inframarginal workers. Such a framework seems unlikely to yield helpful insights about recessions or depressed local labor markets.

Manning (2021) suggests that one way to combine some of the strengths from both approaches is to assume that workers have idiosyncratic preferences over *current* job openings, and that—as in directed search models—one of the attributes of an opening is the size of the application pool. This seems like a promising direction. Another idea is to assume more complicated task-based production functions for firms that lead to minimum skill standards—so many jobs are "off limits" for most workers, even within a given observed skill group (e.g., Haanwinckel 2020; Huckfeldt 2022). This might be a way to incorporate the cyclical upgrading process discussed by Reder (1955) and Okun (1973).

A related modeling issue is how to incorporate strategic interactions in wage setting. We know that firms spend a lot of resources monitoring wages of other employers through specialized sector-specific surveys. We also know that even at the low

end of the labor market, firms respond to wage-setting choices by their competitors (Derenoncourt et al. 2021). It therefore seems necessary to move beyond the "no strategic interactions" case considered in several recent studies. Berger, Herkenhoff, and Mongey (2021) have made some initial progress in this direction.

B. *Who Should Study Wage Setting?*

Once we accept that firms set wages, the analysis of wage setting becomes a part of labor economics, just like the analysis of price setting is a part of IO. Right now, much of the practical discussion of wage setting is done by noneconomists. Human resources departments at large corporations are often staffed by people with primary training in social psychology or sociology. Most business schools have almost no courses on wage setting, and few if any that feature standard economic ideas.

By insisting that "markets set wages," labor economists ceded the field, and had very little to say about questions like the design of online labor markets, or the effects of no-solicitation or no-poaching agreements—other than that they should not matter. We also distanced ourselves from other economists—particularly those in IO—who were busy developing useful models of market power and strategic decision making.

One of the most exciting developments in the field today is the evidence of labor economists taking questions about wage setting seriously. This effort began with Manning's (2003) landmark book: I hope that the growing body of work since then finds its way into the classroom and into the textbooks soon. I also expect this work to lead to some rethinking on policies such as minimum wages, the regulation of trade unions, and anti-trust (see Langella and Manning 2021, and Naidu and Posner 2021). Perhaps we may even see a reevaluation of the widespread belief that excessive wages are the root cause of many economic problems. After all, if your employer set your wage, it's hard to believe that it's too high.

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