Antitrust Remedies for Labor Market Power

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February 23, 2018

Abstract. Recent research indicates that labor market power has contributed to wage inequality and economic stagnation. Although the antitrust laws prohibit firms from restricting competition in labor markets like in product markets, the government does little to address the labor market problem and private litigation has been rare and mostly unsuccessful. The reason is that the analytic methods for evaluating labor market power in antitrust contexts are primitive, far less sophisticated than the legal rules used to judge product market power. To remedy this asymmetry, we propose methods for judging the effects of mergers on labor markets. We also extend our approach to other forms of anticompetitive practices undertaken by employers against workers. We highlight some arguments and evidence indicating that market power may be even more important in labor than in product markets.

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In recent years, a declining economic growth rate and rising income inequality have taken center stage in public debate. Academic research has identified several possible causes, ranging from major structural shifts in the economy to public policy failure. One cause that has received increasing attention from economists is labor market power, the ability of employers to set wages below workers' marginal revenue product.[4] New evidence suggests that many labor markets around the country are not competitive but instead exhibit considerable market power enjoyed by employers, who use their market power to suppress wages.[5] Wage suppression enhances income inequality because it creates a wedge between the incomes of people who work in concentrated and competitive labor markets, and often affects low-income earners the most as they have the fewest options and least bargaining power. More important, though, it reduces the incomes of workers relative to those of people who live off capital, and the latter are almost uniformly higher earners than the former. Wage suppression also interferes with economic growth since it results in underemployment of labor, although it may raise the returns to investment. With wages artificially suppressed, qualified workers decline to take jobs, and workers may underinvest in skills and schooling. Many workers exit the workforce and rely on government benefits, including disability benefits that have become a kind of hidden welfare system.[6] This in turn costs the government both in lost taxes and in greater expenditures. We estimate monopsony power in the U.S. economy reduces overall output and employment by 13%, and labor's share of national output by 22%.[7]

Labor market power is the mirror image of product market power. A *product market* is a (usually) geographic area in which a collection of products is purchased, where the collection of products is defined by frequent consumer substitution. When a small number of sellers or one seller exist, we say that each seller has (product) *market power*, which enables it to charge a price

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[4] See David Autor, David Dorn, Lawrence F. Katz, Christina Patterson & John Van Reenen, The Fall of the Labor Share and the Rise of Superstar Firms (IZA Inst. Lab. Econ., Discussion Paper No. 10756, 2017).

[5] See infra.

[6] See Jordan Weissman, Disability Insurance: America's $124 Billion Secret Welfare Program, Atlantic, March 25, 2013, https://www.theatlantic.com/business/archive/2013/03/disability-insurance-americas-124-billion-secret-welfare-program/274302/.

[7] See infra.

higher than marginal cost, or the price that would prevail in a competitive market. When a small number of employers hire from a pool of workers of a certain skill level within the geographic area in which workers commute, the employers have labor market power.

One major source of market power in both types of markets is *concentration*, where only a few firms operate in a given market. Imagine, for example, a small town with only a few gas stations. Each gas station sets the price of gas to compete with the prices of other gas stations. When a gas station lowers its price, it may obtain greater market share from other gas stations—which increases profits—but it also receives less revenue per sale. If only a single gas station exists, it will maximize profits by charging a high ("monopoly") price because the gains from buyers willing to pay the price exceeds the lost revenue from buyers who stay away. If only a few gas stations exist, they might illegally enter a cartel in which they charge an above-market price and divide the profits, or they might informally coordinate, which is generally not illegal—though the social harm is the same. In contrast, if a large number of gas stations compete, prices will be bargained down to the efficient level—the marginal cost—resulting in low prices for consumers and high aggregate output of gasoline.

Labor market concentration creates monopsony (or, if more than one employer, oligopsony, but we use these terms interchangeably) where labor market power is exercised by the buyer rather than (as in the example of gasoline stations) the seller. Employers are buyers of labor who operate within a labor market. A labor market is a group of jobs (e.g., computer programmers, or lawyers, or unskilled workers) within a geographic area where the holders of those jobs could with relative ease switch among the jobs. The geographic area is usually defined by the commuting distance of workers. A labor market is concentrated if only one or a few employers hire from this pool of workers. For example, imagine the gas stations employ specialist maintenance workers who monitor the gas pumping equipment. If only a few gas stations exist in that area, and no other firms (for example, oil refineries) hire from this pool of workers, then the labor market is concentrated, and the employers have market power in the labor market. To minimize labor costs, the employers will hold wages down below what the workers would be paid in a competitive labor market—their marginal revenue product. Thus, some people qualified to work will refuse to, but the employers gain more from wage savings than they lose as a result of being able to hire fewer workers.

Although product market concentration and labor market concentration are both covered by antitrust law, product market concentration has historically received a huge amount of attention by researchers and government officials, while labor market concentration has received hardly any attention at all.[8] The Justice Department (DOJ) and Federal Trade Commission's (FTC)'s Horizontal Merger Guidelines, which are used to screen potential mergers for antitrust violations, provide an elaborate analytic framework for evaluating the product market effects of mergers. Yet,

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[8] As also noted in Ioana Marinescu & Herbert Hovenkamp, Anticompetitive Mergers in Labor Markets (unpublished manuscript, 2018). This article, written independently of ours, also urges greater attention to the labor market effects of mergers, and, like us, argues that the tools used for analyzing product market effects can be used for labor market effects as well. See also Herbert Hovenkamp, Whatever Did Happen to the Antitrust Movement?, 43-49 (unpublished manuscript, 2018) (arguing for greater attention in antitrust law to labor market effects); Alan B. Krueger & Eric A. Posner, A Proposal for Protecting Low-Income Workers from Monopsony and Collusion 1-12 (Hamilton Project 2018) (arguing that the Merger Guidelines should incorporate labor market effects).

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while the Merger Guidelines state that there is no distinction between seller and buyer power,[9] they say nothing about the possible adverse labor market effects of mergers. Similarly, while there are thousands of reported cases involving allegations that firms have illegally cartelized product markets, there are relatively few cases involving allegations of illegally cartelized labor markets, and many if not most of those cases involve specialized settings such as sports leagues, which restrict the hiring of players.[10]

Concentration is just one source of market power. Others, as we discuss below, include product differentiation and search frictions. All of these sources of market power create inefficiency and redistribution from workers to firm owners. All sources of market power are acknowledged as potential concerns for antitrust, and all can operate on both the product market side as well as the labor market side. Yet antitrust has focused almost exclusively on mitigating product market power.

This historic imbalance between what we will call product market antitrust and labor market antitrust has no basis in economic theory. From an economic standpoint, the dangers to public welfare posed by product market power and labor market power are exactly the same. As Adam Smith recognized, businesses gain in the same way by exploiting product market power and labor market power—enabling them to increase profits by raising prices (in the first case) or by lowering costs (in the second case).[11] For that reason, businesses have the same incentive to obtain product market power and labor market power. Hence the need—in both cases—for an antitrust regime to prevent businesses from obtaining product and labor market power except when there are offsetting social gains.

Why, then, the imbalance between product and labor market antitrust? We do not know the answer to this question, but four possibilities suggest themselves. First, while *economic* theory treats product markets and labor markets similarly, *legal* theory has placed more emphasis on product markets. The reason for this is that since the 1960s, legal scholars have influentially argued that the amorphous norms of antitrust law that prevailed earlier in the twentieth century should be replaced with a laser-like focus on consumer welfare.[12] The resulting shift in focus naturally favored product market analysis because consumers are primarily injured by price increases caused by product market power.[13] In contrast, workers are primarily injured by the exercise of labor market power. Of course, workers are consumers, and so workers benefited from the law's attention to product markets—but not as much as they would have if the law had paid attention to labor markets as well.

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[9] U.S. Dep't of Justice & Federal Trade Comm'n, Horizontal Merger Guidelines § 1 (2010) ("To evaluate whether a merger is likely to enhance market power on the buying side of the market, the Agencies employ essentially the framework described above for evaluating whether a merger is likely to enhance market power on the selling side of the market.").

[10] A Westlaw search for "product market" in the Antitrust Cases database yielded 1,736 cases since 2000, while a search for "labor market" yielded only 122 cases (as of January 10, 2018). If the word "merger" is added to the search, the numbers fall to 366 and 10. In fact, in none of the ten labor market cases was a merger blocked.

[11] Adam Smith, 1 An Inquiry into the Nature and Causes of the Wealth of Nations 82-85 (Oxford, 1976).

[12] For a discussion, see Clayton J. Masterman, The Customer Is Not Always Right, 69 Vand. L. Rev. 1387 (2016).

[13] Id. at 1401-1403.

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Second, economists assumed that labor markets are reasonably competitive, and accordingly that labor market power was not an important social problem. Most people live in urban areas where numerous employers vie for workers. Workers can (and do) move around the country if jobs are scarce or pay is low where they live, putting an upper bound on the social cost of labor market power even if it exists. It is only in recent years that many of these assumptions have been thrown into doubt.[14] Moreover, academic economics has long been divided into separate fields of industrial organization (IO) and labor economics. IO economists have focused on antitrust problems created by mergers and other corporate actions, while labor economists have focused on labor and employment law. Partly as a result, labor economists never developed the analytic tools relevant to forecasting the impact of increased labor market power that are analogous to or draw on the models IO economists use to analyze product market power.

The DOJ and FTC rely heavily on advice from economists on their staff when evaluating mergers, and have frequently challenged mergers based on their effects on product markets.[15] Relying, we suspect, on the traditional assumption of economists that labor markets are competitive, the agencies have never blocked a merger because of its effect on labor markets—or, even, as far as we know, given the labor market effects of a potential merger more than cursory attention. Indeed, those agencies have never, to our knowledge, employed an economist whose primary expertise is in labor markets.

Third, the traditional legal approach to protecting workers, which took place "outside" antitrust law, may have seemed sufficient. This traditional legal approach had two branches—labor law and employment law. Labor law protected workers who sought to form unions to combat the market power of employers. The theory was that if workers banded together, they could use legally mandated collective bargaining and the threat of strikes to prevent employers from paying them monopsony wages. Employment law granted workers specific protections—minimum wages, maximum hours, safe workplaces, privacy rights, and the like. Employment law countered employer labor market power by preventing employers from granting workers wages and benefits below a somewhat artificial floor. However, both types of legal protection have eroded over the years. Union activity has collapsed in the United States because of deregulation, foreign competition, aggressive anti-union tactics by employers, and a chilly legal environment.[16] The federal minimum wage law has eroded as a result of inflation; other employment protections are vulnerable to the vagaries of budget-setting and enforcement priorities among the relevant agencies. And all these worker protection laws assume traditional employment practices, which are rapidly being replaced by independent contractor arrangements, outsourcing, and other practices of the "gig economy."[17]

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[14] See infra.

[15] See U.S. Dep't of Justice, Economic Analysis Group, https://www.justice.gov/atr/about-division/economic-analysis-group.

[16] Henry Farber, Dan Herbst, Ilyana Kuziemko, and Suresh Naidu, Unions and Inequality in the 20th Century: New Evidence from Survey Data (unpublished, 2018).

[17] David Weil, The Fissured Workplace: Why Work Became So Bad for So Many and What Can Be Done to Improve It, (Harv. Univ. Press 2017); Lawrence F. Katz & Alan B. Krueger, The Rise and Nature of Alternative Work Arrangements in the United States (Nat'l Bureau of Econ. Research, Working Paper No. 22667, 2016). On the relationship between monopsony and outsourcing, see Arindrajit Dube and Ethan Kaplan, Does Outsourcing Reduce Wages in the Low-Wage Service Occupations? Evidence from Janitors and Guards, 63.2 Ind. & Lab. Rel. Rev. 287

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Fourth, antitrust litigation against employers is more difficult than antitrust litigation based on product market concentration, perhaps giving the illusion that the latter problem is more significant than the former. Product-market litigation is often brought by large firms, which have the resources and incentives to bear the high costs of complex and expensive antitrust litigation. Class actions by consumers are also relatively straightforward because in a typical antitrust case involving product markets, the argument is simply that the consumers paid a higher price than they should have, which means that the consumers share a common interest as required by courts.[18] In contrast, virtually no worker can hope to obtain damages in an antitrust action—even with the treble damages rule—that would compensate her for the cost of litigation. And class actions brought by workers hardly ever succeed because workers—unlike consumers—are frequently in diverse positions, defeating the common interest requirement. Some workers are senior, others are junior; some have benefits, others do not; some have outside job opportunities, others do not; qualifications vary; contract terms vary; and so on.[19]

The small number of successful antitrust cases involving labor markets bear out these observations. These cases involved highly specialized settings, including, for example, sports leagues that restricted compensation arrangements of athletes, the fashion model market, and doctors and nurses who were regulated by groups of hospitals.[20] These cases were brought by sophisticated and well-paid workers in unusual market settings. Run-of-the-mill cases involving ordinary workers are mostly unheard of. And because successful antitrust actions by workers have been so rare, there is little developed law on the topic, which renders further litigation risky.

That was the intellectual and legal landscape until a few years ago. The consensus that labor markets were competitive collapsed in response to several events. First, there was the revelation that high-profile Silicon Valley tech firms, including Apple and Google, entered no-poaching agreements, in which they agreed not to hire each other's employees.[21] This type of horizontal agreement is a clear violation of the Sherman Act. The firms settled with the government but the casual way in which such major firms, with sophisticated legal staffs, engaged in such a blatant violation of the law appears to have alarmed antitrust authorities. The government subsequently issued guidelines to human resources offices warning them that even implicit agreements not to poach competitors' employees were illegal.[22] In 2016 the White House Council of Economic Advisors and the Department of Treasury issued reports warning of the dangers of

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[18] Fed. R. Civ. P. 23.

(2010); Deborah Goldschmidt and Johannes F. Schmieder. The Rise of Domestic Outsourcing and the Evolution of the German Wage Structure, 132 Q.J. Econ. 1165 (2017).

[19] See, e.g., Weisfeld v. Sun Chem. Corp., 84 Fed.Appx. 257 (3d Cir. 2004) (denying class certification because of lack of common interest among workers). We discuss this problem in greater detail below.

[20] See infra.

[21] See United States v. eBay, Inc., 968 F.Supp.2d 1030 (N.D. Cal. 2013); In re High Tech Emp. Antitrust Litig., 985 F.Supp.2d 1167 (N.D. Cal. 2013); Garrison v. Oracle Corp., 159 F.Supp.3d 1044 (N.D. Cal. 2016). And, relatedly, In re Animation Workers Antitrust Litig., 123 F.Supp.3d 1175 (N.D. Cal. 2015).

[22] U.S. Dep't of Justice & Federal Trade Comm'n, Antitrust Guidance for Human Resource Professionals (2016).

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cartelized labor markets.[23] In recent months, the DOJ has announced that it has launched criminal investigations of firms for entering no-poaching agreements.[24]

Second, the recent discovery that non-compete agreements are extraordinarily common, and frequently applied to low-wage workers raised suspicions that they were being used by employers to exploit their labor market power. For example, Jimmy John's, a sandwich franchise, routinely required low-wage employees to sign covenants not to compete, which apparently deterred those employees from moving to competitors.[25] The covenants not to compete were generally illegal under state laws but they had an *in terrorem* effect on workers who could not afford to consult lawyers.[26] The effect was therefore to reduce mobility between jobs, possibly suppressing wages. Researchers subsequently learned that an enormous number of workers—including low-income, relatively unskilled workers—are bound by restrictive covenants. According to one study, in 2014 12% of workers earning less than $40,000 per year with education below the college level were bound by non-competes.[27] The study also found that workers who entered non-competes in certain labor markets did not receive a compensating wage differential, implying monopsonistic conditions in those markets that caused harm to the employees.[28] Another study found similar results for low-income workers, and in addition that, among all workers, 24.5% reported that they are, or have been, bound by a non-compete agreement.[29] Relatedly, large franchises like McDonald's used no-poaching agreements to reduce competition among franchisees for workers—which in some markets might have resulted in considerable increases in market power. A study found that 53% of major franchisors used no-poaching agreements in 2016, compared to 35.6% in 1996.[30] News media reports provide additional anecdotal evidence of the ubiquity of non-competes and no-poaching agreements, and their powerful effect on labor mobility.[31]

Third, economists began investigating monopsony in labor markets. An important spark for this work was a classic study by David Card and Alan Krueger, which found that employment

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[23] White House, Non-Compete Agreements: Analysis of the Usage, Potential Issues, and State Responses (2016); U.S. Dep't of the Treasury, Office of Econ. Pol'y, Non-Compete Contracts: Economic Effects and Policy Implications (2016).

[24] Eleanor Tyler, Justice Dept. Is Going After "No-Poach" Agreements, Bloomberg BNA (Jan. 19, 2018), https://www.bna.com/justice-dept-going-n73014474358/.

[25] Dave Jamieson, Jimmy John's Makes Low-Wage Workers Sign "Oppressive" Noncompete Agreements, Huffington Post (2014), https://www.huffingtonpost.com/2014/10/13/jimmy-johns-non-compete_n_5978180.html.

[26] In 1985, Michigan's legislature repealed section 145 of the state's antitrust act, which also (apparently unknown to the legislature) contained the prohibition against non-compete clauses. This inadvertent acceptance of non-competes was swiftly seized on by firms, and Marr Marx, Deborah Strumsky, & Lee Fleming, Mobility, Skills, and the Michigan Non-Compete Experiment, 55 Mgmt. Sci. 875 (2009), find that the mobility of inventors fell after this law relative to comparable states.

[27] Evan Starr, JJ Prescott, & Norman Bishara, Noncompetes in the U.S. Labor Force (unpublished, 2017), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2625714.

[28] Id. at 28.

[29] Krueger & Posner, supra note __, at 5.

[30] Alan B. Krueger and Orley Ashenfelter, Theory and Evidence on Employer Collusion in the Franchise Sector (Princeton University Working Paper No. 614, Sept. 28, 2017).

[31] Conor Dougherty, How Noncompete Clauses Keep Workers Locked In., N.Y. Times, May 13, 2017; Conor Dougherty, Noncompete Pacts, Under Siege, Find Haven in Idaho, N.Y. Times, July 14, 2017.

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levels were not affected by a minimum wage hike in New Jersey in 1992.[32] While controversial at the time, many other studies of minimum wage increases in other jurisdictions and at other times produced similar results.[33] A possible explanation for the result is that labor markets are concentrated: if employers pay workers less than their marginal product, then a minimum wage hike—if not too great—will result in higher wages without disemployment. While other explanations are also possible, the monopsony theory gains credence from other studies of the last several years, in which economists, using a range of methodologies as well as previously unavailable sources of data, have found additional evidence of widespread labor market concentration.[34]

Fourth, a wave of industry consolidation has given employers greater bargaining power in labor markets. This industry consolidation, which began in the 1970s,[35] was hardly a secret, but commentators focused on the possible effects on product markets, not labor markets. For example, commentators worried that mergers in the airline industry, which reduced the total number of major American airlines operating in the United States from more than ten in the 1980s to four today,[36] might raise ticket prices for consumers, but not that it might suppress the wages of pilots, flight attendants, and airline mechanics. Hospital consolidation has raised concerns about the creation of monopsony conditions for nurses and physicians, especially in small towns and rural areas.[37] Consolidation has taken place in many less salient industries as well, where working conditions are harsh and wages are low. For example, the meat-packing industry has gone through a series of mergers.[38] Because many food processing establishments are located in remote, rural areas where labor markets are concentrated, the effect of mergers in this industry on wages could be significant. Consolidation unique to the labor market has been in the freelance services industry[39] and the temporary staffing industry.

While the government and private litigants can make inroads on labor market power by suing employers who use no-poaching agreements and other obvious forms of collusion, this type of litigation can have only limited effect. After all, if mergers that dramatically increase labor market power are allowed with little objection, companies can achieve monopsonies by merging rather than by entering agreements with each other. In fact, after years of enforcement neglect

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[32] David Card & Alan B. Krueger, Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania, 90 Amer. Econ. Rev 1397 (2000).

[33] For a recent but already still somewhat dated survey, see John Schmitt, Why Does the Minimum Wage Have No Discernible Effect on Employment? (Center for Econ. & Pol'y Research, 2013).

[34] See José Azar, Ioana Marinescu, & Marshall Steinbaum, Labor Market Concentration (Nat'l Bureau of Econ. Research, Working Paper No. 24147, 2017). We provide further citations to this literature, infra.

[35] Gustavo Grullon, Yelena Larkin, & Roni Michaely, Are US Industries Becoming More Concentrated? (unpublished, 2017); Gauti B. Eggertsson, Jacob A. Robbins, Ella Getz Wold, Kaldor and Piketty's Facts: The Rise of Monopoly Power in the United States (Nat'l Bureau of Econ. Research, Working Paper No. 24287, 2018).

[36] See J.T. Prince & D.H. Simon, The Impact of Mergers on Quality Provision: Evidence from the Airline Industry, 65 J. Ind. Econ. 336 (2017).

[37] Janet Currie, Medhi Farsi, & Bentley MacLeod, Cut to the Bone? Hospital Takeovers and Nurse Employment Contracts 53 ILR Rev. 471 (2005).

[38] Christopher Doering, Who will food industry consolidation squeeze?, USA Today (June 5, 2014), https://www.usatoday.com/story/money/business/2014/06/05/food-companies-mergers/9926501/.

[39] In 2017 TaskRabbit was acquired by IKEA, and in early 2018 WorkMarket was acquired by ADP. Jason D. Rowley, Fiverr's AND CO Acquisition Continues Freelance Consolidation Trend, Crunchbase News (Jan. 24, 2018), https://news.crunchbase.com/news/fiverrs-co-acquisition-continues-freelance-consolidation-trend/.

many labor markets already are concentrated, and under existing antitrust law employers in such markets are permitted to pay workers less than their marginal product. Moreover, subtle forms of anticompetitive behavior—like parallel conduct or implicit coordination—are extremely difficult to detect and often not illegal. A similar set of problems with antitrust enforcement in product markets led to emphasis on blocking mergers and collusion over focusing on conduct. But a merger may increase both product and labor market power, both by increasing concentration and reducing wage competition. By blocking mergers more vigorously, private litigants and antitrust authorities can slow down or halt excessive market power.

In this Article, we argue that the FTC and DOJ should take more seriously the danger that mergers may lead to labor market power as well as product market power.[40] The first step is to update the Horizontal Merger Guidelines to provide a detailed legal framework, comparable to that already provided for product market power, for evaluating the effects of a merger on labor markets.

We suggest three approaches that correspond to the three standard approaches to product-market merger analysis. Under the first approach, which we call Market Definition and Concentration (MDC), the antitrust authorities define the relevant labor market, calculate the level of market concentration, and then estimate the increase in market concentration that would result from a merger. If the merger would take place in an already concentrated labor market, and would increase labor market concentration beyond a threshold, the merger is prohibited, unless the merging parties can prove the efficiency gains from the mergers are great enough to benefit workers on net.

Under the second approach, which we call Downward Wage Pressure (DWP), the regulator calculates the tendency of workers who quit one merging firm as a result of an incremental decrease in wages to join the other merging firm (as opposed to other firms in the labor market or to dropping out of the labor market), and the amount by which workers' wages are below their marginal revenue before the merger. If the product of these figures exceeds the efficiency benefits of the merger, usually 1-2% of wages, then the merger is prohibited, absent compelling evidence of efficiencies, the likelihood of entry, or other features that lessen the merger harm.

Both of these approaches are fairly crude, rule-like ways to trigger scrutiny of mergers. Once a merger is flagged as potentially harmful, analysis should proceed to a second, more exhaustive stage where authorities conduct more detailed investigation. The central role in this stage would be played by merger simulation, as it is in product markets. In such simulations in product markets, economists build a detailed structural economic model of the product market and

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[40] A few scholars have made this argument before but without providing the guidance we seek to supply. See, e.g., John A. Litwinski, Regulation of Labor Market Monopsony, 22 Berkeley J. Emp. & Lab. L. 49 (2001); John B. Kirkwood, Powerful Buyers and Merger Enforcement, 92 B.U. L. Rev. 1485, 1558-59 (2012). A somewhat larger literature on monopsony and the need for antitrust law and the merger guidelines to address it more aggressively sometimes mentions labor market monopsony in passing. See, e.g., Peter C. Carstensen, Buyer Power and the Horizontal Merger Guidelines: Minor Progress on an Important Issue, 14 U. Pa. J. Bus. L. 775 (2012). For a comprehensive discussion, with some attention to labor market issues, see Roger D. Blair & Jeffrey L. Harrison, Monopsony in Law and Economics (2010).

the behavior of firms within it. They then estimate the model econometrically and simulate how a merger is likely to change prices, quality, innovation, and so forth.[41]

A similar approach can be applied to labor markets. Models of imperfect competition in labor markets, driven by the difficulties with searching for jobs, by amenities that are specific to a particular work place, and by other factors, have become increasingly prominent in recent years.[42] These models should be supplemented with analysis of less easily-quantified factors, including the likely effect of the merger on the quality of jobs (e.g. the nature of the workplace environment, the parental leave policy, etc.), on entry of new employers into the labor market, innovation in the workplace, and related factors. As in standard product market analysis, all these factors are worth considering in determining whether a merger should proceed.

The paper is organized as follows. In Part I, we provide the legal and economic background to the current concerns about labor market concentration. In Part II, we propose and defend the three types of merger analysis for labor market effects. While we focus on mergers, because they are the best-developed area of antitrust law, many other areas of antitrust have strong analogs in labor markets, where they should be applied. Hence in Part III, we discuss other ways in which concepts and doctrines used in antitrust law to address concentration of product markets can be applied to labor market concentration.

I. The Rise of Labor Monopsony

A. The Economics of Labor Market Power

1. The Intellectual History of Monopsony

The term "monopsony" was coined by the British economist Joan Robinson in 1933.[43] Before then, economists who wrote about industry structure focused on monopoly and market power in the product market. It had long been clear that large corporations like Standard Oil monopolized goods and services. Robinson realized that corporations also exercised market power on the "buy side"—in their purchases of inputs, including goods, services, and labor. The monopsony power of corporations was just as common as their monopoly power, perhaps more common, but harder to detect.

To be sure, long before Robinson's book, critics of capitalism like Karl Marx had denounced employers' treatment of their workers. They argued that employers "exploited" their workers by underpaying them, subjecting them to substandard working conditions, and busting unions. Marx argued that employers could keep wages low by taking advantage of what he called

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[41] See Oliver Budzinski & Isabel Ruhmer, Merger Simulation in Competition Policy: A Survey, 6 J. Competition Law & Econ. 277 (2010).

[42] See David Card, Ana Rute Cardoso, Joerg Hening, & Patrick Kline, Firms and Labor Market Inequality: Evidence and Some Theory, 36 J. Lab. Econ. S13 (2017) for a model that adapts discrete choice to the labor market.

[43] Joan Robinson, The Economics of Imperfect Competition (1933); Robert J. Thornton, Retrospectives: How Joan Robinson and B. L. Hallward Named Monopsony, 18 J. Econ. Persp. 257 (2004).

the "reserve army of the unemployed."[44] Because people desperately sought work, employers could keep workers' wages below the value of their labor, at their "labor power" (the minimum they needed to continue working). The extraction of the resulting "surplus value" by the employer was what Marx called "exploitation." Robinson's analysis of monopsonistic labor markets provided a more rigorous formulation of the problem of employer dominance. She pointed out that if labor markets are competitive, employers cannot exploit workers in Marx's sense because workers who are paid only enough to avoid starvation will be able to sell their labor to other employers at a higher wage. Yet labor markets need not be competitive, and when they are not, the outcome for workers is similar to those that Marx identified: excess unemployment, a permanent gap between wages and worker productivity, poor working conditions, and domination of the workers by employers.[45]

Some scholars believe that elements of feudalism, preserved through the common law, may also have helped employers gain and preserve monopsony power, and retarded the development of appropriate legal responses to it. In England, anticompetitive elements of master and servant law dated back to the 1351 Statute of Labourers.[46] These rules included enticement doctrines, which blocked employers from poaching each other's workers, and criminalization of worker "absconding," i.e., leaving an employer without permission. The feudal legacies may have legitimized anticompetitive practices in labor markets.[47] In the postbellum U.S. South these doctrines were resuscitated as a component of Jim Crow labor law,[48] while in the North, these doctrines were used by courts to resist the rising labor movement.[49] Nineteenth- century labor activists identified market power of employers as a justification for collective bargaining and regulation, complaining of "wage slavery" and drawing analogies to chattel slavery.[50]

While Marx held that the increasing concentration of labor markets under capitalism would spark a revolutionary transition to socialism, the major effect was instead unionization, which, while often militant, was focused on improving wages and conditions for workers rather than changing the world. In the United States and other western countries, governments initially resisted the labor movement, often violently, but ultimately accommodated it. Under pressure from unions, governments passed laws that protected workers from low wages, excessive hours, dangerous

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[44] Marx discussed this concept, originally coined by Friedrich Engels, in numerous works, including Karl Marx, Capital: A Critique of Political Economy, vol. 1 (Ben Fowkes trans., 1992).

[45] Monopsony can yield a notion of "arbitrary" domination. Wage-setting employers suffer only second-order losses from idiosyncratic misbehavior of employers, while this type of non-profit maximizing behavior would be competed away in a perfectly competitive labor market. Cf. Gary Becker, The Economics of Discrimination (1957).

[46] Statute of Labourers, 23 Edw. 3.

[47] See Karen Orren, Belated Feudalism: Labor, the Law, and Liberal Development in the United States (Cambridge University Press, 1991); Christopher L. Tomlins, Law, Labor, and Ideology in the Early American Republic (Cambridge University Press, 1993).

[48] Suresh Naidu, Recruitment Restrictions and Labor Markets: Evidence from the Postbellum US South, 28 J. Lab. Econ. 413 (2010).

[49] See Suresh Naidu & Noam Yuchtman, Labor Market Institutions in the Gilded Age of American Economic History (Nat'l Bureau of Econ. Research, Working Paper No. 22117, 2016) for evidence that nineteenth-century northern labor markets were monopsonistic, and that the violent conflict of the period was over these labor market rents.

[50] Alex Gourevitch, From Slavery to the Cooperative Commonwealth: Labor and Republican Liberty in the Nineteenth Century (Cambridge University Press, 2014).

workplaces,[51] and other abuses, and that protected labor organization from interference by employers.[52]

The bottom-up nature of worker organization probably accounts for a major bifurcation in the way the law treats the problem of market power. While antitrust law, beginning with the Sherman Act of 1890,[53] nominally applied to labor markets as well as product markets, it has rarely been used to protect workers. Instead, antitrust law has focused on product markets, while labor and employment law has dealt with market power in labor markets. These two traditions have developed in parallel over a century, rarely coming into contact.

This bifurcation of the law led to a bifurcation in economic theory. To address monopolization of product markets, economists developed the field of industrial organization, which seeks to explain how market power affects the structure of business mainly in relation to product markets. To address abuses in the labor market, economists developed the field of labor economics, which focuses on unions and employment regulations. This dual bifurcation in law and theory may explain why an assumption emerged that labor markets are competitive, and hence do not need antitrust law.

However, labor and employment law have failed to accomplish many of their goals, with the result that labor market concentration is as bad as ever. Beginning in the 1970s and accelerating in the 1980s and 1990s, public policy turned against labor and employment law. The "neoliberal" revolution reflected frustration with the rigidity of traditional labor law and the disruptions caused by labor unions that struggled to adapt to changing technology and circumstances. Yet rather than adapt new labor laws or organizations better suited to the age of globalization and digitization, reformers focused on dismantling existing labor protections and anti-union legislation.

As unions declined, however, labor markets did not lose their rigidities. Instead, they seemed to become more concentrated. The concurrent decline of unions and rise of labor market concentration implies that the neoliberal assumption that unions, rather than employers, are the major source of cartelization of labor markets was false. This provoked economists to revisit the assumption of perfect competition.

2. The Sources of Monopsony Power

Economists have identified several sources of labor market power. Because these sources have counterparts in the more familiar analysis of product markets, where they have been subject to considerable legal analysis, we will introduce each of them by way of the product market.

In product markets, there are three primary barriers to competition. First, *market concentration* refers to the existence of one or a small number of sellers, usually the result of increasing returns to scale, high fixed costs, or network effects. Second, *product differentiation* exists when goods or services are different from each other rather than fungible; differences across products make comparison difficult, which reduces competition. Third, *search frictions* make it

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[51] E.g., The Fair Labor Standards Act of 1938, 29 U.S.C. §§ 201-219, 557 (2012).
[52] The National Labor Relations Act, 29 U.S.C. §§ 151-169 (2012).
[53] 15 U.S.C. §§ 1-7 (2012).

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hard for consumers to compare products and seek out the best offering. In both the academic literature and legal adjudication, market concentration typically plays the central role in analysis, with less emphasis on product differentiation, and the least emphasis on search.

In the literature on labor markets, by contrast, the problem of search frictions has played the central role, following the Nobel Prize-winning work of Peter Diamond, Dale Mortensen, and Christopher Pissarides.[54] In 1998, Burdett and Mortensen proposed a model of labor markets with a large number of identical workers and identical firms where search frictions naturally lead employers to have monopsony power.[55] The pioneering theoretical and empirical work of Alan Manning, culminating in his influential 2003 book *Monopsony in Motion*, presented a wide variety of evidence in favor of what is called the dynamic monopsony model.[56] This work assumes workers must spend and time and effort to find jobs. Because a worker's existing employer knows that the worker's search cost is high, the employer can reduce compensation—including wages, benefits, and workplace amenities—or fail to increase compensation despite the worker's contributions because the employer knows that the worker can find an alternative job only with difficulty.

In recent years, labor economists have focused on firm-specific amenities of a workplace—which is the labor market correlate to product differentiation.[57] Imagine two workplaces that are identical at an initial point. The employer of each workplace seeks to deter workers from leaving. To do so, an employer might offer an amenity that its workers happen to like—say, a coffee bar, or a yoga studio, or hot showers. Other amenities might rise more naturally: for example, the location of an employer might appeal to workers because of the convenience for commuting or the attraction of nearby restaurants or other businesses. Differing amenities give rise to search frictions, as noted above, but they separately make it more difficult for workers to compare firms. Indeed, the identities of the other workers at a workplace—whether they are driven and intense, or friendly and laid back, or young or old—matters to people, and even very similar-seeming employers, for example, law firms, might be very different in practice. As we will see below, there are good reasons to believe that such differentiation is more significant in labor than in product markets and thus that labor markets tend to be much narrower than product markets are.

The final and most neglected cause of labor market power is the concentration of labor markets due to economies of scale, network effects, fixed costs, and other factors. The basic idea here is that in many industries a firm with many employees can churn out goods and services more efficiently—at less cost per unit of output—than firms with fewer employees can. The literature on this phenomenon is limited, though we discuss a few recent analyses in the next subsection.

Our discussion so far might give the impression that labor markets and product markets are similar: they are both vulnerable to market power (monopsony in the first case, monopoly in the

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[54] James Albrecht, Search Theory: The 2010 Nobel Memorial Prize in Economic Sciences, 113 Scandinavian J. Econ. 237 (2011).

[55] Kenneth Burdett & Dale T. Mortensen, Wage Differentials, Employer Size, and Unemployment, 39 Int'l Econ. Rev. 257 (1998).

[56] See Alan Manning, Monopsony in Motion: Imperfect Competition in Labor Markets (Princeton University Press, 2003); Alan Manning, Imperfect Competition in the Labor Market, 4 Handbook of Lab. Econ. 973 (2011).

[57] See Venkataraman Bhaksar & Ted To, Minimum Wages for Ronald McDonald Monopsonies: A Theory of Monopsonistic Competition, 109 Econ. J. 190 (1999); Card et al., supra note ___.

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second), and for the same reasons. But there is reason to believe that labor markets are more vulnerable to monopsony than products markets are to monopoly, thanks to yet another new literature in economics. This literature, for which Lloyd Shapley and Alvin Roth were awarded the Nobel Prize, emphasizes the importance of matching for labor markets.[58] The key point is that in labor markets, unlike in product markets, the preferences of *both* sides of the market affect whether a transaction is desirable.

Compare buying a house in the product market and searching for a job. Both are important choices that can affect the course of a life. However, there is a crucial difference. In a house sale, only the buyer cares about the identity, nature, and features of the product in question—the house. The seller cares nothing about the buyer or (in most cases) what the buyer plans do with the house. In employment, the employer cares about the identity and characteristics of the employee *and* the employee cares about the identity and characteristic of the employer. Complexity runs in both directions rather than in one. Employers search for employees who are not just qualified, but who possess skills and personality that are a good match to the culture and needs of that employer. At the same time, employees are looking for an employer with a workplace and working conditions that are a good match for their needs, preferences, and family situation. Only when these two sets of preferences and requirements "match" will a hire be made.

This two-sided differentiation is why low skilled workers may be as or even more vulnerable to monopsony than high skilled workers, despite possibly being seen as less differentiated by employers. Low-skill workers may have less access to transportation, well-situated housing markets, and job information, and be more dependent on informal networks, all of which make jobs less substitutable and employers more differentiated.

This dual set of relevant preferences means that labor markets are *doubly* differentiated both by the idiosyncratic preferences of employers and those of workers. In some sense this "squares" the differentiation that exists in product markets, naturally making labor markets thinner than product markets, meaning that the cost of entering a transaction—in relation to the gains from trade—are on average greater in employment markets than in product markets because people are not as interchangeable as goods are.

These matching frictions both cause and reinforce the typically long-term nature of employment relationships compared to most product purchases, leading to significant lock-in within employment relationships. They are also reinforced by the more geographically constrained nature of labor markets. In our increasingly digital and globalized world, products are easily shipped around the country and world; people are not. While traveling is easier than in the past, and telecommuting has become more common, labor markets remain extremely local while most product markets are regional, national, or even global. The overwhelming majority of jobs still require physical proximity of the employer, greatly narrowing the geographic scope of most labor markets, given that many workers are not willing to move away from family to take a job. Two-income families further complicate these issues because each spouse must find a job in the area in which the other can, further narrowing labor markets. Together these factors naturally make labor

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[58] Cathrine Rampell, Two From U.S. Win Nobel in Economics, N.Y. Times, Oct. 15, 2012, http://www.nytimes.com/2012/10/16/business/economy/alvin-roth-and-lloyd-shapley-win-nobel-in-economic-science.html.

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markets highly vulnerable to monopsony power, much more vulnerable than most product markets are to monopoly power.

3. The Social Cost of Monopsony

The economics of labor market power and the harms it causes is closely analogous to the theory of product market monopoly. Recall that a monopolist is a firm that need not take market prices as given, but can raise its price, at the cost of some lost demand, to increase the profits it earns. In choosing an optimal price the firm faces a trade-off. Raising the price reduces sales, but also increases the price the firm can charge on each unit. The higher the firm raises its price, the costlier it is to lose extra demand, as each sale is very profitable. Eventually the firm finds a balance point, where the value of the lost sales from raising the price further just equals the increased profits on the units it sells at the increased price. This is the "monopoly optimal price." The firm's absolute mark-up is the gap between this price and the firm's cost. The mark-up equals the difference between the monopoly price and the competitive price, and thus serves as a natural gauge of market power, as we will discuss below.

A similar trade-off between profit-per-unit and number of units sold applies to firms that are not literally monopolists but have some power over their price. In fact, in some sense, every firm with any market power is a "monopolist" over some market, though maybe one too narrow and in too direct competition with other markets to matter much.

The analysis of monopsony in labor markets is closely analogous. In a competitive labor market, firms equate the going wage of workers to their "marginal revenue product," the amount of additional revenue the worker can generate. When an employer has a monopsony, it considers the fact that to hire an additional worker it will have to raise the prevailing level of wages for its existing workers and that doing this will increase its overall labor costs. Conversely if it lowers wages, while it will lose some workers, it will also lower the wage bill on the workers it already employs. As in the monopoly case, a monopsonist will not internalize this effect on workers and will choose an "absolute markdown" of wages below the marginal revenue product. Again, we will usually use "markdown" to refer to this absolute markdown as a proportion to the wage, which may well be greater than 100% (the marginal revenue product may be more than twice the wage). Just as with firms with market power, an employer with labor market power may not have a "monopsony" over some easily described market, but so long as it will not lose its entire workforce by slightly lowering its wage, it has some labor market power.[59]

We must introduce two lamentable pieces of jargon here. Economists use the word "elasticity" to refer to the sensitivity to which one thing reacts to another. "Labor market elasticity" refers to the sensitivity with which workers react to changes in wages. Suppose that wages across the economy decline a tiny amount, and everyone quits. Then labor market elasticity is infinity. Suppose instead that no one quits; then labor market elasticity is 0. Elasticity can range from 0 to infinity; the general view is that labor market elasticity across the economy is in the neighborhood

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[59] For the complete analysis of monopsony in labor markets, see, e.g., Alan Manning, Monopsony in Motion: Imperfect Competition in Labor Markets 29-52 (2003).

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of 0.5, suggesting a high level of inelasticity.[60] This means, intuitively, that people tend to stay in the workforce even when wages decline: they need to support themselves.

The second, even more awful, term is "residual labor supply elasticity," which refers to the sensitivity with which workers react to changes in wages at a particular *firm*. Suppose a computer programmer who works at Google would quit and move to Apple if wages at Google decline by a tiny amount. Then the residual labor supply elasticity is infinity. If the programmer would not quit even if Google lowered wages significantly, then the firm-level elasticity is closer to zero. Like labor market elasticity (sometimes called "aggregate labor supply elasticity," to distinguish it from" residual labor supply elasticity"), residual labor supply elasticity can fall anywhere along this continuum. But it varies greatly from industry to industry, from close to 0 to, as we will discuss below, 5, 10, or higher.[61]

Residual labor supply elasticity is a simple measure of a firm's labor market power. If workers do not quit even if the firm lowers wages significantly (elasticity is low), then the firm enjoys significant market power over the workers. This is the number that antitrust policy focuses on. If residual labor supply elasticity that a firm faces is high, then the labor market from which a firm draws its workers is competitive, and the firm cannot "exploit" workers. If it is low, workers need protection.

The economic consequences of labor market power are analogous to those of product market power. Product market power has two well-known effects. It *redistributes* from consumers to the firm: consumers must pay more for products and the firm earns greater profits at their expense. And it creates *waste* or *deadweight loss*. Some consumers would be willing to pay the efficient, marginal cost price that the firm would have charged in a competitive market, but are not willing to pay the higher price the monopolist chooses to charge.

Similarly, monoposony power has two effects. It redistributes from workers to employers by lowering wages. And it creates waste: some workers would have been willing to work for the employer if they had been paid their full marginal revenue product, but will quit if they are paid the marked-down wage the monopsonist offers. This leads to increased unemployment or non-employment as workers find prevailing wages unacceptable and exit the labor force or refuse to take available jobs.

Note that the waste created by monopsony (and monopoly) depends crucially on the inability of firms to pay (charge) different rates to different workers (consumers), although the redistributive effects do not. If an employer can pay a worker a bit more than that worker's outside option, then every worker would be paid a different amount (depending on the value of the outside option, which in turn could reflect local connections and the like), then it can employ every worker whose marginal product revenue exceeds the wage. But employers cannot practice wage discrimination very effectively. They have little information about workers' outside options, and

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[60] See Raj Chetty, Bounds on Elasticities with Optimization Frictions: A Synthesis of Micro and Macro Evidence on Labor Supply, 80 Econometrica 969, 1015 (2012). For a more recent review, see Michael Keane & Richard Rogerson, Reconciling Micro and Macro Labor Supply Elasticities: A Structural Perspective, 7 Ann. Rev. Econ. 89, 114 (2015).
[61] See infra.

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are deterred by powerful pay fairness norms.[62] The product market again offers a useful lesson: analogous price discrimination by sellers is difficult and rare. However, the emergence of sophisticated prediction algorithms applied to vast troves of human resource data suggest that the ability to wage discriminate in the future may be expanded.[63]

Monopsony power creates other negative effects as well. First, to the extent that the degree of monopsony power differs across employers, it will also lead to misemployment: workers may be more productive at employer A, which has a lot of labor market power, than at employer B which has a little. But B may offer higher wages because of its limited labor market power. The worker may thus choose to work at B, lowering the productivity of the economy.

Second, employers will often cut benefits, rather than cut wages, to take advantage of workers who are locked into the job. The firm has no need to retain these workers and thus may wastefully degrade conditions of work these "stuck" workers particularly value, instead catering only to the workers the firm is worried about losing.[64]

Third, monopsony also raises prices for consumers. This may seem counterintuitive: won't lower wages to workers be reflected in reduced consumer prices? In fact, the reverse is true. To see this, note that if firms employ fewer workers, they will produce less output, resulting in higher prices. While the firm lowers *wages* to workers, the *cost* to the firm of *hiring* workers actually rises as the firm now takes into account the fact that, when it hires an additional worker, it also will pay the rest of its workers more. It is this full marginal cost of an additional worker and not merely the wages that the firm now accounts for and passes on to consumers as higher, not lower, prices.[65]

Fourth, monopsony power also reinforces and exacerbates monopoly power. In fact, both can be seen at a high level as just two ways for the owners of capital to squeeze workers and thus reduce the returns to productive work and thus the output of the economy. The marked-down on wages caused by monopsony and the mark-up on prices caused by monopoly can be seen as akin to taxes—payments that ordinary people must pay in order to go about their daily life as producers and consumers. However, the payments do not go to governments to fund programs, but to firms, and ultimately, investors. And the payments do not spur investment and raise economic growth because they depend in the first place on the willingness of managers to leave capital idle in order to obtain market power, while driving workers out of the workforce and onto taxpayer-financed relief programs.

4. Recent Developments: Evidence of Labor Market Concentration

Evidence that labor markets are monopsonistic, particularly in low-wage labor markets,

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[62] See e.g. David Card, Alexandre Mas, Enrico Moretti, & Emmanuel Saez, Inequality at Work: The Effect of Peer Salaries on Job Satisfaction, 102 Am. Econ. Rev. 2981 (2012).

[63] Evy Rombaut & Marie-Anne Guerry, Predicting Voluntary Turnover through Human Resources Database Analysis, 41 Mgmt. Research Rev. 96 (2017).

[64] Michael Spence has highlighted an analogous distortion in the product market. A. Michael Spence, Monopoly, Quality and Regulation, 6 Bell J. Econ. 417 (1975).

[65] However, if the product market is competitive, prices for consumers will not rise. The reduced sales of the monoposonist will be offset by the sales of new firms that enter the product market.

has been accumulating over the past two decades. The evidence consists of studies of many different markets, which tend to show that residual labor market elasticities are extremely low. We should acknowledge at the outset that all such studies face considerable methodological difficulties. The gold-standard measure would be a large-scale experimental estimate of the labor-supply elasticity facing a firm, where the employer is somehow persuaded to randomize the wages it offers workers. One group of authors did manage such an experiment, and found a residual labor market elasticity of 2.15. But the study involved government workers in Mexico, and hence may not be generalizable for the United States.[66] Convincing firms to randomize their wages in the United States has so far proven hard, and so researchers have relied on a variety of natural experiments and indirect observations to estimate the extent of labor market power.[67]

An early finding that stimulated the development of monopsony as a candidate model of the labor market for low-skill labor was the evidence on minimum wage effects produced by David Card and Alan Krueger.[68] Conventional wisdom in the economic profession at the time held that minimum wage laws will reduce employment, based on the assumption that low-skill workers are normally paid a competitive wage. In a given market, for example, a city, there are many employers who are willing to hire low-skill workers—including custodial workers, security guards, sandwich makers, and the like. The multiplicity of possible employment opportunities should minimize the labor market power of any particular employer. If so, then employers pay workers a wage equal to their marginal product, and an employer who is forced by law to raise wages would have to fire any workers whose marginal product is below the legal minimum or lose money. However, Card and Krueger found no such wage effect, suggesting that workers were paid less than their marginal product and hence the employer could absorb the higher wage rate. Numerous studies have attempted to replicate the Card and Krueger result, too many to discuss here. But many studies found evidence consistent with Card and Krueger's. For example, Arindrajit Dube, Suresh Naidu, and Michael Reich found that the San Francisco minimum wage law of 2007 raised wages without lowering employment, and lowered turnover.[69] Recent work by Dube, Reich, and T. William Lechter expands the analysis to the entire U.S. labor market and finds that minimum wage laws increase wages without reducing overall employment.[70]

The labor supply curve facing the firm consists of both flows of workers into the firm ("recruit") and flows of workers out of the firm ("retention"). The sensitivity of these flows to the

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[66] See e.g., Ernesto Dal Bó, Frederico Finan, & Martín A. Rossi; Strengthening State Capabilities: The Role of Financial Incentives in the Call to Public Service, 128 Q. J. Econ. 1169 (2013). The authors randomize advertised wages for government jobs in Mexico, and found that the Mexican government possessed a significant degree of monopsony power, with labor supply elasticity of 2.15, comparable to the findings of studies of monopsony power that did not use randomization.

[67] Much of the earlier work focused on the market for nursing because of antitrust litigation against hospitals. The results were mixed, very likely because of data limitations that the more recent work, discussed below, has made progress on. See, e.g., Janet Currie, Mehdi Farsi & W. Bentley Macleod, Cut to the Bone? Hospital Takeovers and Nurse Employment Contracts, 58 Indus. & Lab. Rel. Rev. 494 (2005) (and citations therein).

[68] David Card, Lawrence F. Katz & Alan B. Krueger, Comment on David Neumark and William Wascher, Employment Effects of Minimum and Subminimum Wages: Panel Data on State Minimum Wage Laws, 47 Indus. & Lab. Rel. Rev. 487 (1994).

[69] Arindrajit Dube, Suresh Naidu, & Michael Reich, The Economic Effects of a Citywide Minimum Wage, 60 Indus. & Lab. Rel. Rev. 522 (2007).

[70] Arindrajit Dube, T. William Lester, & Michael Reich, Minimum Wage Shocks, Employment Flows, and Labor Market Frictions, 34 J. Lab. Econ. 663 (2016).

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wage recovers the residual labor supply elasticity facing the firm. Alan Manning, who was an early developer of the empirical case for monopsony,[71] showed that while quits are decreasing and recruits increasing in the wage recruits are increasing in the wage in the United States and United Kingdom, the implied elasticities are much smaller in magnitude than would be expected from a perfectly competitive model. But Manning's empirical analysis was hampered by data limitations, which introduced many confounds.

Douglas Webber was able to overcome some of these limitations by using the Longitudinal Employer Household Dynamics (LEHD) data from the U.S. Census, which provides more fine-grained information about workers, and covers nearly all non-farm jobs.[72] These data, which include matched worker-firm wages, allow direct estimation of the effect of firm wages on the rate of new hiring and the rate of separations, controlling for worker fixed effects, and thus eliminating some of the endogeneity of wages (for example due to worker skill). Controlling for worker and firm fixed effects, Webber estimates a residual labor supply elasticity of 1.08. In a subsequent paper, Webber show that women have lower job mobility than men, and finds that the residual labor supply elasticity for women is 0.15 less than that for men, which is also inconsistent with the hypothesis of competitive labor markets.[73] In a competitive labor market, firms would pay women and men of equal skill exactly the same amount, the competitive wage. Dube and coauthors conduct a meta-analysis of experimentally varied wages on Amazon Mechanical Turk and document surprisingly low labor supply elasticities (less than 0.5) in this market with putatively low search frictions and a large number of workers and firms.[74]

David Card and his coauthors estimate the rent-sharing elasticity (meaning, the extent to which a firm and a worker share value generated by the worker's work), where firm-level measures of value added are correlated with firm-level wages, and provide recent evidence from matched worker-firm data.[75] Both of these sources of evidence suggest that firms do not simply take market wages as given, but instead transmit idiosyncratic variation in sales/profitability into wages. The importance of variations in firms in explaining wages is further evidence that the assumption of competitive markets is unwarranted, since in competitive markets only the worker's marginal product, not the firm's characteristics, determines the wage. Patrick Kline and coauthors provide recent, clean, evidence on monopsony using exogenous variation in patent grants to examine the effect of changes in firm profitability on worker wages.[76] They find that wages of even low-skill workers respond to these shocks, with an implied residual labor supply elasticity facing the firm of 2.5. However, they find this effect is limited to incumbent workers, and does not increase wages of new recruits.

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[71] Alan Manning, A Generalised Model of Monopsony (2001); see also Alan Manning, Monopsony in Motion: Imperfect Competition in Labor Markets (2003).

[72] Douglas A. Webber, Firm Market Power and the Earnings Distribution, 35 Lab. Econ. 123 (2015).

[73] Douglas A. Webber, Firm-Level Monopsony and the Gender Pay Gap, 55 Ind. Relat. 323 (2016).

[74] Arindrajit Dube, Jeff Jacobs, Suresh Naidu, & Siddharth Suri, Monopsony in Online Labor Markets, (forthcoming 2018).

[75] David E. Card, Ana Rute Cardoso, & Joerg Heining, Firms and Labor Market Inequality: Evidence and Some Theory, 36 J. Lab. Econ. S13 (2016).

[76] Patrick Kline, Neviana Petkova, Heidi Williams, & Owen Zidar, Who Profits from Patents? Rent-Sharing at Innovative Firms, (Inst. for Research on Lab. & Employment, Working Paper No. 107-17, 2017), http://irle.berkeley.edu/files/2017/Who-Profits-from-Patents.pdf.

Another way to assess monopsony is to estimate effects of labor market concentration on wages. The labor market is defined by commuting distance for a given occupation. Alan Manning and Barbara Petrongolo estimate a structural model on job application data from the UK to look at application behavior of workers, and find that workers' application rates to a job are quite sensitive to distance, suggesting that labor markets are quite local.[77] Ioana Marinescu and Roland Rathelot also find quite sharp sensitivity of applications to distance in United States data, with application rates falling by 35% for jobs 10 miles away from a worker's residence.[78] In a recent blockbuster paper, José Azar and his coauthors find substantial labor market concentration in labor markets throughout United States,[79] a finding confirmed by yet another near-contemporaneous study performed using a different data source.[80]

Further evidence on monopsony is provided by (grim) evidence on worker deaths. Adam Isen estimates the effect of worker deaths on payroll and sales, and finds that sales fall more than payroll, suggesting that workers are paid less than their marginal product. Isen estimates a residual labor supply elasticity between 2.5 and 5.5.[81] Another piece of indirect evidence is provided by bunching in the wage distribution. If residual labor supply elasticity is high, then employers will be careful to pay workers a wage close to their marginal product revenue, and will avoid basing wages on simple rules of thumb that may be inaccurate for particular workers. Arindrajit Dube and coauthors obtain administrative data on hourly wages and document considerable bunching at $10.00 per hour and other round numbers.[82] Using a model with worker and firm behavioral biases, they translate the extent of bunching into bounds on labor market power. Their results suggest that if firms are losing no more than 5% of profits from mispricing labor at a round number, the implied residual labor supply elasticity is roughly 2.5, and if firms are only losing 1% of profits the implied elasticity is between 1 and 1.5. Labor market power allows firms that mistakenly pay wages below marginal product to survive.

What, concretely, do these findings suggest about wages, employment, and other features of the labor market? Recall that until the recent literature began a few decades ago, economists assumed very high elasticities. Overall, the recent evidence suggests that low labor elasticities, ranging from 1 to 5 (and possibly even lower), are surprisingly common throughout the economy. Even the residual supply of low-skill labor is relatively inelastic, in the range of 1 to 3, despite the earlier conventional wisdom that inelastic labor markets were caused by the time and cost of obtaining education and specialized training, which low-skilled workers, by definition, lack.

In the online Appendix,[83] we conduct a few simple calibrations of the efficiency and

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[77] Alan Manning & Barbara Petrongolo, How Local Are Labor Markets? Evidence from a Spatial Job Search Model, 107 Am. Econ. Rev. 2877 (2017).

[78] Ioana Marinescu & Roland Rathelot, Mismatch Unemployment and The Geography of Job Search, (Nat'l Bureau of Econ. Research, Working Paper No. 22672, 2017).

[79] José Azar, Ioana Marinescu, & Marshall Steinbaum, Labor Market Concentration (Nat'l Bureau of Econ. Research, Working Paper No. 24147, 2017).

[80] Efraim Benmelech, Nittai Bergman, & Hyunseob Kim, Strong Employers and Weak Employees: How Does Employer Concentration Affect Wages? (Nat'l Bureau of Econ. Research, Working Paper No. 24037, 2018).

[81] Adam Isen, Dying to Know: Are Workers Paid Their Marginal Product? (University of Pennsylvania Wharton School of Business Working Paper, 2013).

[82] Dube et al., supra note __.

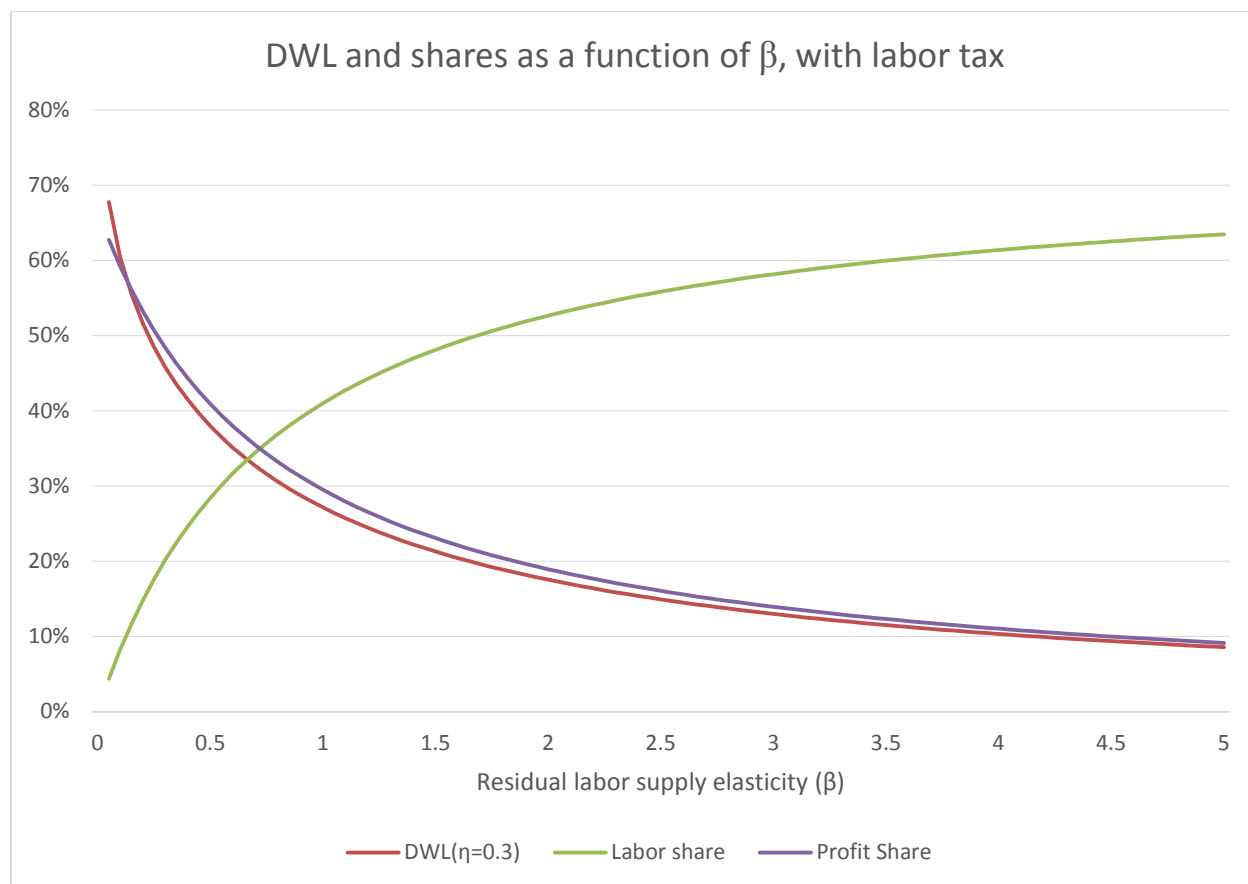[83] The Appendix will be made available on the web.

distributional consequences of a variety of levels of labor market power. We assume an economy governed by a Cobb-Douglas production function[84] with a (competitive) labor share of 2/3, together with a perfectly elastic supply of capital at a 5% interest rate. We use an aggregate labor supply elasticity of 0.3, which governs employment decisions of workers, which is the midpoint of the extensive (participation in the labor market or not) and intensive (number of hours worked) elasticities of 0.17 or 0.5, both drawn from work by Raj Chetty.[85] The aggregate labor supply elasticity, η, which measures the sensitivity of employment to wages, is important for recovering the aggregate disemployment, and hence deadweight loss, effects of monopsony, as it measures the extent to which workers stop working in response to the lower wages induced by monopsony. In our preferred scenario, we also incorporate a labor tax of 30% with a fiscal multiplier of 1.3, to examine the interaction of monopsony with existing taxes: monoposony, by causing workers to drop out of the labor market, may further harm society by lowering tax intake and increasing social transfers.

Back-of-the-envelope calculations indicate that across the economy, a residual labor supply elasticity, denoted β, of 3 implies that wages are marked down by 25%, and workers similarly on average lose 22% of their share of output including public goods (from 75% to 58%) as a result of employer labor market power. The monopsony profit share—meaning the share of output that firms obtain because of monopsony power rather than their productive activities—is 14% in this scenario. This inequity is compounded by inefficiency: this level of monopsony also reduces aggregate employment and overall GDP by almost 13%. This distortion is partially due to fiscal effects, as government revenue is only 70% of what it would be at the competitive equilibrium. While stylized and simplified, this suggests that the rise of monopsony power over the past few decades could be great enough to account for many of the disturbing economic trends in the United States: the fall by almost 10 percentage points in labor's share, the dramatic decline in employment rates among prime aged men, budget shortfalls, and the "secular stagnation" of economic growth.

In Figure 1, we show how the labor and profit shares change with the degree of monopsony. As the residual labor supply elasticity increases (the horizontal axis), the labor share increases towards 73.8% (66% of private output plus 26% due to the value of public goods) and the profit share goes to 0, while the remainder (the capital share which is not graphed for legibility) decreases to 26.2% (all shown on the vertical axis). This can be considered a baseline: if labor markets were perfectly competitive, as economists so long assumed, then these figures would represent labor's and capital's share of output, while the deadweight cost from monopsony would be (obviously) zero. Figure 1 also shows how the aggregate deadweight loss due to monopsony falls as the labor market becomes competitive.

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[84] For non-economists, this is just a standard way to model the relationship between inputs (labor and capital) and production (goods and services). See Cobb-Douglas Production Function, Wikipedia (Dec. 17, 2017), https://en.wikipedia.org/wiki/Cobb%E2%80%93Douglas_production_function.

[85] Chetty, supra note __, at 1015.

DWL and shares as a function of β, with labor tax

Residual labor supply elasticity (β)

— DWL(η=0.3)   — Labor share   — Profit Share

As Figure 1 shows, we may not worry much, as a matter of public policy, if residual labor supply elasticity is not exactly infinity: as it rises into the double digits, the incremental benefit of eliminating labor market power increases very slowly. The significance of the recent empirical literature is that it shows that throughout the economy, labor market elasticities of 3 or lower are common, and here the loss to workers is significant, as is the overall economic waste. Within particular markets, where workers are vulnerable because of their lack of skills, or because of specific constraints they face on mobility (as is often the case with women), or because of other factors, addressing labor market power is extremely urgent.

We also include Table 1 below, which ties the research we have cited more directly to our findings.

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β	Implied markdown	Source	DWL	Labor share	Profit share	Fiscal Loss
0.1	10	Staiger et al. (2010)	60.5%	8%	59%	95.6%
0.12	8.3	Dube et al. (2017a)	58.3%	10%	58%	94.5%
0.95	1.05	Azar et al. (2017)	28.0%	40%	30%	60.7%
2	0.5		17.6%	53%	19%	41.0%
2.7	0.37	Kline et al. (2017)	14.1%	57%	15%	33.6%
3	0.33	Dube et al. (2017b)	13.0%	58%	14%	31.2%
3.7	0.27	Ransom and Sims (2010)	11.0%	61%	12%	26.7%
5.5	0.18	Isen (2013)	7.9%	65%	8%	19.5%
10	0.1		4.6%	68%	5%	11.7%
100	0.01		0.5%	73%	1%	1.3%

Table 1: Cobb Douglas estimates under a $\tau = 30\%$, competitive capital share $\alpha = .33$, aggregate market labor supply elasticity $\eta = .3$, and labor tax with efficiency multiplier of $m = 1.3$

The studies suggest residual labor market elasticities ranging from 0.1 to 5.5. These correspond to deadweight loss ranging from 60.5% down to 7.9%, and a labor share ranging from 8% to 65%. Thus, even if one takes a conservative approach and believes the studies with weaker findings, it remains clear that monopsony causes considerable harm both to the economy and to workers. We offer by comparison hypothetical residual labor market elasticities of 10 and 100. By the time one reaches 100, the harm to the economy is only 0.5%, and arguably no longer a matter for public concern. The "implied markdown" column shows the effect on wages. If a worker with a marginal revenue product of $50,000 is employed by a firm facing elasticity of 100, she will be paid $49,504.95. If the elasticity is 3, she will be paid $37,500. If the elasticity is 0.1, then she will be paid $4,545.45 (at least in theory).

B. Antitrust Law and Labor Markets

1. Antitrust Litigation Relating to Labor Markets

The antitrust laws broadly prohibit firms from creating monopolies and cartels, and taking other actions that reduce the competitiveness of markets. Section 1 of the Sherman Act prohibits contracts "in restraint of trade."[86] Section 2 of the same law prohibits attempts to "monopolize … any part of the trade or commerce among the several States."[87] The Clayton Act prohibits various practices associated with market concentration, including price discrimination[88] and—of special interest to us—mergers and asset acquisitions where "the effect of such [merger or] acquisition may be substantially to lessen competition, or tend to create a monopoly."[89] The unusually broad language of the antitrust laws have been given specific meaning by the courts over many decades of judicial development.

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[86] 15 U.S.C. § 1 (2004).
[87] 15 U.S.C. § 2 (2004).
[88] 15 U.S.C. § 13 (1914).
[89] Id.

The vast majority of cases have involved efforts to block sellers from cartelizing or monopolizing product markets. However, the law and the cases are not limited to anticompetitive behavior by sellers. The courts have recognized that buyers can engage in anticompetitive behavior. When all the sellers in a market sell to a single buyer, the buyer is said to have a monopsony. When only a few buyers exist, an oligopsony exists, and the buyers violate the antitrust laws if they conspire to suppress prices by agreeing not to compete for products sold by sellers in the market. Because the statutes do not distinguish sell-side and buy-side anticompetitive behavior, and buy-side anticompetitive behavior produces the same type of harm as sell-side anticompetitive behavior, the Supreme Court and other courts have not hesitated to recognize that the antitrust laws apply to both types of behavior.[90]

Most monopsony cases involve allegations that buyers have tried to monopsonize or cartelize markets for goods and services. Consider, for example, a big retailer like Walmart, which may possess the buy-side market power to suppress the prices that it pays to wholesalers. A handful of such cases involve buyers who have tried to monopsonize or cartelize the labor market. Again, nothing in the antitrust laws distinguish labor markets from other types of market, and the courts have agreed that anticompetitive behavior in labor markets violates the antitrust law. The partial exception is section 6 of the Clayton Act, which provides that workers do not violate antitrust laws when they organize unions—a form of labor cartel, at least in the economic sense.[91] Indeed, prior to the Clayton Act, the most frequent use of antitrust in labor markets was to enjoin labor unions as anti-competitive. But no court has held that section 6 immunizes an employer from antitrust liability if that employer attempts to suppress competition in the labor markets.

However, antitrust litigation based on anticompetitive behavior by employers in labor markets has historically been quite rare, and mostly involved narrow and idiosyncratic settings like sports leagues.[92] In a handful of cases, employees have challenged cartel-like arrangements under section 1 of the Sherman Act, arguing that employers have fixed wages or taken other actions to suppress competition among themselves for labor. The most prominent cases have involved hospitals, which have been accused of coordinating pay scales for doctors and nurses.[93]

Moreover, as far as we have been able to discover, antitrust challenges relating to labor markets have never gone beyond the most overt type of cartelization among rival employers. The Horizontal Merger Guidelines focus almost entirely on the risk of product market concentration, and says nothing about the risks of labor market concentration.[94] As far as we know, the DOJ and FTC have *never* challenged a merger because of its possible anticompetitive effects on labor markets, or even rigorously analyzed the labor market effects of mergers as they do for product market effects. Nor have we found a reported case in which a court found that a merger resulted in illegal labor market concentration.[95]

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[90] Weyerhauser Co. v. Ross-Simmons Hardwood Lumber Co., 549 U.S. 312 (2007).

[91] 15 U.S.C. § 17 (1914); see also 29 U.S.C. § 52 (1914), and note the non-statutory exemption recognized in Brown v. Pro Football, Inc., 518 U.S. 231 (1996).

[92] See, e.g., Banks v. Nat'l Collegiate Athletic Ass'n, 977 F.2d 1081, 1084 (7th Cir. 1992).

[93] See, e.g., Kartell v. Blue Shield of Mass., 749 F.2d 922, 924-25 (1st Cir.1984) (Breyer, J.).

[94] Horizontal Merger Guidelines, supra note __.

[95] See also Hovenkamp, supra note __.

The infrequency and rather unusual nature of antitrust litigation involving labor markets for a long time seemed to verify economists' assumption that labor markets are normally competitive. But the erosion of this assumption in recent years—driven, as noted above, by the consolidation of employers, the non-compete scandal, and empirical evidence of wage stagnation and labor market concentration—has been accompanied by significantly greater legal and regulatory activity.

In 2010, the Justice Department entered a settlement with major high-tech firms—including Apple, Google, and Amazon—which had entered into no-poaching agreements, which are agreements not to hire away each other's employees.[96] The DOJ and FTC also issued a guidance document informing firms that it is illegal to enter into such agreements.[97] The scandal over non-competes led the White House and Department of Treasury to issue reports criticizing the use of non-compete agreements, while many state legislatures have considered bills and passed laws restricting non-compete agreements involving low-wage workers.[98] The White House report also noted substantial evidence of labor market concentration, warranting stricter enforcement of antitrust laws against employers. Litigation has also been commenced against McDonald's and other firms that use no-poaching agreements within franchises.[99] The Justice Department has revealed that it has begun criminal investigations against employers suspected of entering no-poaching agreements.[100]

A key worry in this flurry of activity is that anticompetitive practices targeted the most vulnerable workers, those with limited education and low skills. Moreover, the tech industry notwithstanding, there remains relatively little evidence of explicit cartelization that can be easily targeted by the antitrust laws. This means that the anticompetitive behavior has taken the form either of employer consolidation through mergers, or hard-to-detect parallel behavior, in which firms play follow the leader without making any explicit agreements. In both cases, the problem boils down to excessive merger activity, which has led to concentrated labor markets. This is hardly surprising given that there is no enforcement against mergers for their effects on employment: why would employers take the risk of colluding when they could just merge?

2. Class Action Requirements and Related Barriers to Challenges of Anticompetitive Labor Market Practices

Antitrust cases are notoriously complex and expensive. A typical antitrust violation raises prices (or lower wages) a relatively small amount over a vast number of people. This means that individuals rarely have an incentive to sue even while the social cost of anticompetitive behavior may be high. For product market antitrust violations, lawsuits occur in three ways. First, victims

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[96] U.S. Dep't of Justice, Office of Public Affairs, Justice Department Requires Six High Tech Companies to Stop Entering into Anticompetitive Employee Solicitation Agreements (Sept. 24, 2010), https://www.justice.gov/opa/pr/justice-department-requires-six-high-tech-companies-stop-entering-anticompetitive-employee.

[97] U.S. Dep't of Justice & Federal Trade Comm'n, Antitrust Guidance for Human Resource Professionals (2016).

[98] See Krueger & Posner, supra note __, at 11-12.

[99] Rachel Abrams, Why Aren't Paychecks Growing? A Burger-Joint Clause Offers a Clue, N.Y. Times (Sept. 27, 2017).

[100] Mark L. Krotoski, DOJ Antitrust Division Announces Imminent Criminal Prosecution for "No Poaching" Agreements, National Law Review (Feb. 6, 2018).

may often be large firms, such as downstream buyers, whose losses are large enough to justify the expense of litigation. Second, when victims are consumers, lawyers can sometimes aggregate them into a class and bring a class action on their behalf. Third, the DOJ and FTC bring lawsuits in the most serious cases. While the remedy of treble damages helps encourage lawsuits in the first two scenarios, an array of other doctrines relating to standing, enforcement, and related matters,[101] deprive certain victims of the power to bring suit.

These problems are even more significant for labor market cases. The DOJ and the FTC paid little attention to labor market concentration until a couple years ago. There is no such thing as a worker who can afford to bring an antitrust case on her own. And class actions are harder to bring in labor market cases than in product market cases.

One case, Weisfeld v. Sun Chem. Corp., illustrates the difficulties faced by class action lawyers.[102] The plaintiff class argued that a group of companies that manufacture printing inks entered into a "no hire" agreement, in which each company agreed not to hire the workers of its competitors in violation of section 1 of the Sherman Act. The proposed class consisted of "personnel who provide technical services and who possess specialized knowledge and skills in the manufacture, distribution and sale of printing inks."[103] The plaintiff argued that a class action was justified because economists could calculate how much wages were suppressed as a result of the illegal agreement.

The court rejected this argument because common issues did not "predominate," as required by federal class action rules. There was extensive variation among employees, including their propensity to seek out new jobs if they were unhappy with their wages; the extent of their skills and responsibilities, which result in different salary levels; the transferability of an employee's skill to other industries; the existence of a non-compete agreement; and so on.[104] Because the employer's market power thus differed from employee to employee, the extent of the injury for each employee was different, nor could it be determined by a simple algorithm with a limited number of observable inputs.

These sorts of variations are ubiquitous in labor markets: workers, even in the most rigidly controlled workplaces, are not as fungible as goods are. It is thus not hard to understand why labor market litigation is so rare.[105] In recent years, worker class actions have enjoyed more success, but again in nearly all cases the workers are professionals or specialists rather than the most vulnerable workers.[106] This means that firms have a far freer hand to exploit (and obtain) market power over

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[101] See, e.g., Brunswick Corp. v. Pueblo Bowl-O-Mat, Inc., 429 U.S. 477 (1977) (requiring antitrust injury).

[102] 84 Fed.Appx. 257 (3d Cir. 2004).

[103] Id. at 259.

[104] Id. at 263-64.

[105] The most common type of successful litigation against monopsonistic behavior in labor markets, at least in proportion to its economic important, involves sports leagues. Two unusual features of this litigation helps explain its relative success: the need to have explicit and publicly known rules to regulate league behavior and the large amounts of money at stake per athlete. See, e.g., Int'l Boxing Club of N. Y., Inc. v. United States, 358 U.S. 242 (1959) (holding that arrangement among boxing promotors violated antitrust laws); O'Bannon v. Nat'l Collegiate Athletic Ass'n, 802 F.3d 1049 (9th Cir. 2015) (holding that NCAA rules violated antitrust laws);

[106] See Nitsch et al. v. Dreamworks Animation SKG Inc., 315 F.R.D. 270 (N.D. Cal. 2016) (animation employees); In re High-Tech Employee Antitrust Litigation, 985 F. Supp. 2d 1167 (N.D. Cal. 2013) (software engineers); In re NCAA Student-Athlete Name & Likeness Licensing Litig., No. C 09-1967 CW, 2013 U.S. Dist. LEXIS 160739 (N.D.

labor than market power over products, and goes a long way to explaining why labor market concentration has become such a significant problem.

II. Merger Analysis of Labor Market Harms

In this section, we develop a variety of metrics and analytic tools that can be used to evaluate the effects of mergers on product markets. We begin by extending two techniques used to screen mergers in product markets at early stages to labor markets, then turn to additional factors and techniques employed at later stages, where we also consider possible merger defenses. We conclude this section with a brief case study that applies these techniques to an example from the labor market for nurses.

A. Market Definition and Concentration

The Market Definition and Concentration (MDC) approach involves three steps, which we lay out below. For expository ease, we rely on a simple example. Imagine that a small town has four large firms that manufacture widgets for the national market. The firms employ two types of workers: specialists, who are experienced and skilled in the manufacture of widgets; and generalists, who provide services that are also in demand by other types of employers. Custodial services would be an example of generalist work. If a firm fires a custodian, she may find work at any other firm with floors that need to cleaned, while a specialist who is fired would be able to find work only at another widget manufacturer. The four firms are identical in size: they both produce the same number of widgets and employ the same number of workers. Two of the firms propose to merge, and we must evaluate the possible effect of the merger on the labor market.

Market Definition. To determine market definition, we can use, by analogy to the "hypothetical monopolist test,"[107] a hypothetical monopsonist test. Under this test, the analyst asks whether a single monopsonist—in this case, a single hypothetical firm that employs all specialists who live in this town (rather than the actual four firms, acting independently)—could reduce wages by a "small but significant and non-transitory" amount, what we call the small but significant and non-transitory decrease in wages (SSNDW) test. The intuition here is that a labor market comprises firms that compete by offering a particular type of job to attract workers with a particular skill set. If only a single firm offers that job or desires that sort of worker, and lowers the wage from the competitive amount, many of the workers would accept the lower wage because the alternative would be to undergo retraining or accept a job at another firm that does not exploit the worker's education, skills, or experience. In our example, workers who specialize in manufacturing widgets would likely accept a lower wage because the alternative is either to move to another area (which is expensive and involves loss of local attachments) or to accept a worse job. Thus, the specialists

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Cal. Nov. 8, 2013) (granting class certification in part for student athletes); Cason-Merenda v. VHS of Michigan, Inc., 296 F.R.D. 528 (E.D. Mich. 2013) (nurses); Cason-Merenda v. VHS of Michigan, Inc., No. 06-15601, 2014 U.S. Dist. LEXIS 29447 (E.D. Mich. Mar. 7, 2014) (nurses); Fleischman v. Albany Medical Center, No. 06-cv-0765, 2008 U.S. Dist. LEXIS 57188 (N.D.N.Y. July 28, 2008) (nurses). But there are also many other cases in which class certification was denied.

[107] Horizontal Merger Guidelines, supra note __, at 9 ("would impose at least a small but significant and non-transitory increase in price").

form a labor market. By contrast, the generalists—say, custodians—may be able to find jobs at other employers, including schools, office buildings, and so on, in which case the relevant labor market is quite broad.

In some cases, the market may be narrower than this. As we noted above, labor markets are matching markets so not only the needs of firms, but also the preferences of workers, help determine the bounds of the market. Suppose that the other two firms (those not merging) both have a production process that is easy to keep within normal, 9-5 business hours, while the merging firms, while requiring the same specialist expertise, have a process that must be kept going all hours of the night. The merging firms thus require specialists willing to work the night shift and only a relatively small set of workers may be willing to do this.[108] Given that many workers are not willing to do this, "specialist work, in this area, on the night shift" may constitute a relevant market.

Another key factor in defining labor markets is geographic and is determined by how far and by what means of transit workers are willing to commute to a job. Imagine that a fifth firm that employs widget specialists is located in a nearby town. If specialists in the first town are willing to commute to this nearby town, then the number of firms that draw from the specialist labor market is actually five rather than four, and (as we will see) market concentration is lower. Complicated questions arise as to how far workers are willing to commute and under what conditions. For example, younger workers may be willing to commute farther or even move from one location to another, while older married workers or those with children may be less mobile. However, as in the case of product market analysis, rules of thumbs can be used to define the relative geographic area and be further refined in more-detailed analysis.[109]

What counts as a SSNDW and how is it determined? In analysis of product markets, a rule of thumb is 5% for one year. A similar threshold could be used for labor market analysis as well. In our example, if a hypothetical widget specialist labor monopsonist could reduce wages from (say) $80,000 per year to $76,000 per year for the specialists, then the specialist widget workers would compose a labor market. Profit-maximizing employers will find it in their interest to institute such a wage reduction if the elasticity of labor supply in the relevant market is twenty or less assuming the market was previously competitive, or under other conditions that can easily be defined empirically if there was pre-existing labor market power.[110]

Econometric studies can be used to measure whether the market definition is appropriate, as is often done in product markets. For example, shocks to firm production processes or firm-specific input prices may move around the marginal revenue product of workers, leading to changes in their wages. The induced movement of workers provides a measurement of residual labor supply elasticities. Another loose but creative way to measure market definition is proposed by Azar et al., who use the patterns of job searches on an online job matching platform to define which careers job seekers view as substitutes for one another.[111]

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[108] Alexandre Mas & Amanda Pallais, Valuing Alternative Work Arrangements (unpublished, 2017).

[109] See, e.g., Reed v. Advocate Health Care, 268 F.R.D. 573, 590 (N.D. Ill. 2009) (recognizing labor market based on commuting distance).

[110] The markdown is simply the reciprocal of the elasticity.

[111] See Azar et al., supra note __.

Market Concentration. Market concentration refers to the number of firms in a relevant market. Market concentration increases as the number of firms decline, indicating that the remaining firms have greater market power. In product markets, the HHI is used to measure market concentration. HHI equals the sum of the squares of the percent market shares of the firms that sell into a market. HHI can also be used to represent labor market concentration. In labor markets, HHI equals the sum of the squares of the share of the labor market. The highest possible HHI is 10,000, which occurs when a market has a single monopolist ($100^2 = 10,000$). As the number of firms increase indefinitely, HHI approaches (but never quite reaches) zero.

In our example, we stipulated that the four employers sell widgets into a national market. If each firm has a, say, 1% market share, and 96 other firms also have a 1% market share, then the HHI is 100 ($1^2 + 1^2 + …$). We also stipulate that the four employers equally divided the market of widget specialists. This means that the HHI for widget specialists is 2500 ($4 * 25^2$). The HHI for generalists will be lower. If, say, 1,000 firms in the town hire custodians and all have a small fraction of the custodian labor market, the HHI for custodians is close to 10.

The Horizontal Merger Guidelines classify markets as unconcentrated (HHI less than 1,500); moderately concentrated (HHI between 1,500 and 2,500); and highly concentrated (HHI above 2,500).[112] These classifications serve as triggers: the government will (generally speaking) allow mergers in unconcentrated product markets and scrutinize those in highly concentrated markets, while taking a moderate approach to those in the middle. Because of the symmetrical nature of labor and product markets, we believe that the government (and the law generally) should take the same approach when analyzing the effects of mergers on labor markets.

Effect on Market Concentration. The risk posed by a merger is that it increases market concentration, which can cause harm in two different ways. In product markets, a firm that gains market power through concentration can raise prices by reducing output ("unilateral effects").[113] And as the number of firms decline, the remaining firms can more easily engage in either explicit or implicit collusion such as parallel pricing, which also result in higher prices and reduced output ("coordinated effects").[114] Mergers pose the same risks to labor markets. A firm that gains power in the labor market may be able to reduce wages and employment; when the number of employers decline, they can more easily engage in implicit or explicit collusion with the same effects.

The Merger Guidelines hence treat increases in market concentration as a parallel trigger for scrutiny. If the post-merger product market remains unconcentrated, or the merger increases the HHI by fewer than 100 points, the government generally allows the merger. If the merger results in a moderately concentrated market and an increase of the HHI by more than 100 points, then the government will scrutinize the merger. If the merger results in a highly concentrated market along with an HHI increase of 100-200 points, the merger will also receive scrutiny; and if the HHI increase exceeds 200 points, the merger is subject to a rebuttable presumption that it is illegal, as we discuss below.[115]

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[112] Horizontal Merger Guidelines, supra note __, at § 5.3.
[113] Id.
[114] Id. at § 7.
[115] Id. at 19.

Again, because of the symmetry of product market and labor market concentration, we believe that the government should use the same standard to evaluate the effects of mergers on labor markets. In our example, a merger of the two firms would increase HHI for widget specialists from 2,500 to 3,750 ($50^2 + 25^2 + 25^2$), a substantial increase that would create a rebuttable presumption that the merger excessively concentrates the market, generating significant anticompetitive effects in violation of the antitrust laws. The HHI increase for generalists is trivial, as it is on the product market side.

Comments. We have shown that the MDC approach to merger analysis can be used to analyze the labor market effects of mergers just as it is used to analyze the product market effects of mergers. We find it mysterious that this analysis has never been performed—as far we know—by the government or in private litigation. One argument we have heard is that labor markets are more difficult to define than product markets are. Commuting distances are not always easy to calculate: workers are willing to commute farther for some types of jobs than others.[116] And job differences are not always clear. However, we are skeptical that these problems are any more severe than in the case of product markets, where products often differ from each other in incremental and complex ways, so that the distinctions between products are not always clear. Furthermore, geographic scope is often just as complex in product markets, where the willingness of consumers to travel to purchase is at least as slippery. Meanwhile, modern job clearinghouses like CareerBuilder and LinkedIn are accumulating data on the boundaries of labor markets; their data can be used by antitrust authorities.[117]

A more significant argument is that the MDC approach does not make sense even for product markets, and therefore should not be used for labor markets as well.[118] Some readers might wonder where the various HHI thresholds come from, and the answer is that they are, to some extent, arbitrary. The MDC approach can be derived from standard economic models of oligopoly, which show that firms gain less by raising prices over marginal cost as their market share declines. But the derivation depends on strong assumptions that may not be sufficiently realistic to justify heavy reliance on MDC. Our purpose here is not to defend the MDC approach, but to argue that if the MDC approach is accepted for product markets (as it is by the government and courts), then it should be used for labor markets as well. Otherwise, firms that are thwarted in their efforts to raise prices by merging with product market rivals will naturally be led to merge with labor market rivals to lower the cost of labor. But for skeptics of the MDC approach, we offer the alternative DWP approach, which we discuss in the next section.

B. Downward Wage Pressure

In recent years, the MDC approach in product markets has increasingly been supplanted by the use of "Upward Pricing Pressure (UPP)" indices. These indices are more closely tied to credible economic models of unilateral effects than the MDC approach is. Because it was invented

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[116] See Alan Manning & Barbara Petrongolo, How Local are Labor Markets? Evidence from a Spatial Job Search Model 107 Am. Econ. Rev. 2877 (2017).

[117] See Azar et al., supra note __.

[118] Louis Kaplow has cogently made this argument in a series of articles. See, e.g., Louis Kaplow, Market Definition: Impossible and Counterproductive, 79 Antitrust Law J. 1 (2013).

recently,[119] it has not played as important a role in litigation as MDC has, but it does receive a brief mention, and the government's imprimatur, in the Merger Guidelines.[120] Like MDC, UPP has been used only to analyze the product market effects of mergers. Here, we develop an analogous idea that we call Downward Wage Pressure (DWP) for labor market harms, using our example from above. Like UPP, DWP is the product of two terms, which we now discuss in turn. These two terms correspond roughly to market concentration and the increase in concentration caused by the merger, as they measure the degree of pre-existing market power and the increased market power created by the merger.

Markdown. To measure pre-existing market power, rather than define a market and measure its concentration, UPP more directly measures the extent to which firms, prior to the merger, can hold wages below their competitive level. This is measured by the "markup," the percent by which the price the firms charge exceeds the marginal cost that they would charge under competition.

In labor markets, we instead consider the mark*down*. The markdown is a direct measure of power the firm has over the market and, as we noted above, is the inverse of the elasticity of the labor supply facing that employer for a profit-maximizing employer.[121] The markdown is the percent by which the wage falls below the worker's marginal revenue product, the amount of additional revenue that employing that worker generates. To be precise, the markdown equals 100 times the ratio of the gap between the marginal revenue product and the wage. The markdown for each merging firm may be different. And markdowns can be measured either by using accounting data from firms or, as in the case of market definition, through econometric studies that measure the elasticity of residual labor supply.

Diversion Ratio. To measure the degree to which a merger will tend to increase market power, the DWP approach uses the concept of a "diversion ratio" rather than the increase in concentration caused by a merger. To understand what this is, note that firms may merge either to combine operations to reduce costs or in order to internalize the externalities each firm's competition has on the other. Consider, for example, the calculations that would go into a merger of GM and Ford. Before the merger, GM earns a profit on each car equal to revenue minus marginal costs. When it decides whether to sell an additional car by lowering its price, it makes a tradeoff: it sells more cars (while Ford sells fewer cars), but it earns less profit (or "markup") per car as its price falls. The optimal price perfectly balances these two forces, which is why the elasticity (the ratio of additional cars sold to the price fall) determines the optimal mark-up to set.

Now imagine that the two automakers merge. To understand the effect of the merger on the firm's pricing decision, one can usefully imagine that GM and Ford continue as divisions of the merged entity. The CEO of the merged entity directs the division head of GM and the division head of Ford to maximize profits for the merged entity, not for the individual divisions. The GM head will think as follows. When GM lowers its price to sell a car, the merged entity not only forgoes the higher markups per GM car that comes with a higher price. The merged entity also

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[119] See Joseph Farrell & Carl Shapiro, Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition, 10 B.E. J. Theoretical Econ. (2010).

[120] Horizontal Merger Guidelines, supra note __, at 21-22.

[121] See supra note __.

loses the markups on Ford cars that are not sold because of the additional sales of GM cars at the lower price. The opportunity cost of the lost sale of a Ford car enters GM's calculations, resulting in a weaker incentive for the GM division head to lower prices (or a stronger incentive to increase prices). The same is true for the Ford division head.

These effects can be represented as *diversion ratios*. The GM-to-Ford diversion ratio is the fraction of additional Ford sales that are diverted from GM (rather than from another car company or that are new sales that would not otherwise have been made) when Ford lowers its prices. A diversion ratio is calculated from Ford to GM as well.

In the case of labor market effects, we engage in an analogous analysis. When two of our widget producers seek to merge, the analyst calculates diversion ratios with respect to their workers. In the case of specialists, the diversion ratio for each merging firm is the fraction of specialists who would quit and join the other merging firm (rather than joining a non-merging firm or dropping out of the labor market) if the first firm lowers wages. The diversion ratio will obviously be higher for the specialists than for the generalist. If a specialist quits Firm 1, then she can find work only at one of the three other firms, and so, even if she acts randomly, there is a 1/3 chance that she would end up at the other merging firm. In contrast, if a generalist quits Firm 1, she can find work at any of the dozens of other firms in the town that hire generalists.

The diversion ratio measures the extent to which a merger increases market power more directly than HHI does. The problem with the HHI method is that different employers within a market may be different quality substitutes for each other in a way that HHI obscures.

Take our example of the night shift. Should we define the market for specialist workers working the night shift to include only the two merging firms, on the assumption that those currently not working night shifts would be unwilling to do it? Or should we define the market more broadly, to include all firms hiring specialists? Obviously neither definition is ideal. The diversion ratio allows us to express this "in between" case through the fraction of specialists who would take a nightshift job if a higher wage is offered. If 100% of the nightshift specialists are employed at the other merging firm, the diversion ratio is 100%. If these workers are evenly divided among all the firms that hire specialists, the diversion ratio will be only 33%. Normally, the diversion ratio will fall somewhere in between: nightshift workers will be more likely to take these additional jobs, but they will not be the only ones to take the job, and they will not come equally from all other employers. We might imagine that 50-70% of the specialists will come from the other nightshift job at the other merging employer, so the diversion ratio will be around two-thirds.

Another advantage of diversion ratios is that they are easier to estimate than market definitions are. One natural proxy for diversion ratios is turnover. Surveys and other methods can determine the fraction of workers at Firm 1 who move to Firm 2 rather than to other firms or out of the labor market. If Firm 1 and Firm 2 then merge, this ratio provides a starting point for estimating the diversion ratio. Another source of information that can be used to estimate the diversion ratio is job hunting data. This data source reveals information about where workers interview; if many of Firm 1's hires also interviewed at Firm 2, this suggests that the two firms compete for workers, and hence that a merger between them will reduce labor market competition.

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Effects. The DWP index for Employer A is the markdown *of Employer B* multiplied by the diversion ratio *from Employer B to Employer A*. To understand why, consider the difference between what happens to Employer A's finances if it lowers wages pre-merger and if it lowers wages post-merger. To hire an additional worker pre-merger, Employer A must raise its wage. The worker it hires will, with a chance equal to the diversion ratio, be taken from Employer B, but Employer A really does not care where the worker comes from.

After the merger, this changes dramatically. Employer A now cares about the profits earned by Employer B. If the worker is diverted from Employer B, Employer A now effectively suffers a loss equal to the markdown Employer B was earning off that employee. This loss occurs with a probability equal to the diversion ratio from Employer B to Employer A, and thus the product of the B-to-A diversion ratio with B's markdown constitutes the additional cost of an additional employee A faces after the merger that it did not face before the merger.

The DWP does not directly tell us how much worker's wages will fall. Instead, it tells us the *tax* on wages to which the merger is equivalent. The merger taxes wages because it makes hiring the worker effectively more expensive for the employers. How much of this tax is passed through to workers as a decreased wage and how much will be absorbed by the employer and/or passed through to consumers as higher prices depends on market conditions usually summarized as the "pass-through rate."[122] In some cases worker wages may fall by even more than the amount of this tax. Thus, while DWP comes much closer than the MDC to measuring the effects of mergers on wages, it does not go all the way, much less determine the losses to worker or social welfare caused by the merger.

UPP numbers are usually compared to some small standard threshold, like 1-2%, to determine whether cases are worth reviewing. A 1-2% tax on wages is a material weight on the decision of firms. Of course, any positive DWP is a cause for concern, but authorities have typically assumed in product markets that there are usually some efficiency gains from mergers, perhaps on the order of 1-2%, that are likely to offset at least some harms from reduced competition. Analogously it seems reasonable as a starting point to "flag" for serious consideration mergers where DWP for both firms exceeds 2% and to give less scrutiny to mergers where both are below 1%. Intermediate cases must be carefully considered.

Comments. The DWP, like the MDC, should be understood as a "rule," that is, a (relatively) simple proxy that provides guidance to regulated parties but only an approximation of the underlying social value of a proposed merger. We do not take a position in this paper whether the MDC or the DWP is a better rule, or in fact whether either of them is an optimal rule; they might well work better in different market settings. The MDC is better-established and draws on long experience of the agencies and courts. The DWP seems more theoretically sound, and recent work has continued to refine it as well as provide reason to believe that it may work better than the MDC.

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[122] E. Glen Weyl & Michael Fabinger, Pass-Through as an Economic Tool: Principles of Incidence under Imperfect Competition,121 J. Pol. Econ. 528 (2013); Sonia Jaffe & E. Glen Weyl, The First-Order Approach to Merger Analysis, 5 Am. Econ. J.: Microeconomics 188 (2013).

A virtue of both approaches is that they are flexible and can be easily modified if further evidence suggests that they are too strict or to not strict enough. In the case of the MDC, one can raise or lower the HHI thresholds, to make merger challenges harder or easier. In the case of the DWP, one can adjust the assumed efficiency level of a merger.

A last point concerns the complexity of many mergers, which can have different effects in different markets. A merger can reduce competition in both product markets and labor markets, and it can reduce competition in some geographic (product) markets and not others, and the same with labor markets. Consider, for example, the merger of two nationwide hospital chains. The merger might reduce the number of rival hospitals in big city X from 15 to 14 and the number of rival hospitals in small town Y from 3 to 2. Obviously, the product market and labor market effects will be greater in the small town than in the big city. But even within the small town, the product market and labor market effects are likely to be different. If there is no other place to obtain medical care, the product market effects will be significant. However, if the small town happens to have a large retirement community with assisted-living facilities, where nurses are frequently employed, then it is possible that the labor market effects of the merger—with respect to the market in nurses—is less severe. Most employers offer multiple jobs, just as most producers offer many products, and the rich interactions between the many products or jobs of one merging firm with the many products or jobs of the other must be considered. When evaluating mergers, all these complex product and labor market effects must be considered, and remedies (as in the case of traditional merger analysis) might involve spinning off some of the underlying entities in some of the markets.

C. Merger Simulation

While MDC and DWP are the dominant tools for early-stage screening in merger analysis and have played a large role even in later stages, economic modeling of industries and simulation of merger effects have become increasingly common in recent years. While MDC and DWP identify triggers that justify further scrutiny of a merger, or may in themselves strongly indicate that a proposed merger is socially harmful, a model is used to make fine-grained predictions of all effects of a merger. The model assumes that firms maximize profits; rely on a presumed production technology; and react, in game-theoretic terms, to the behavior of other firms. The parameters of the model are estimated using industry data and techniques that are increasingly standard in the industrial organization literature.[123]

In recent years, economists have extended the traditional models so as to account for a greater variety of phenomena. These phenomena include dynamic effects such as the possibility that a merger will encourage entry or discourage innovation; vertical effects such as the possibility that a merger may reduce the so-called "double marginalization problem" or conversely may increase the incentives of a firm to raise the cost of its rivals; and the effect of mergers on bargaining between firms in business-to-business industries.[124] Much of the field of industrial

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[123] Aviv Nevo, Mergers With Differentiated Products: The Case of the Ready-To-Eat Cereal Industry, 31 Rand J. Econ. 395 (2000).

[124] See, e.g., Mitsuri Igami, Estimating the Innovator's Dilemma: Structural Analysis of Creative Destruction in the Hard Disk Drive Industry, 1981-1998, 125 J. Pol. Econ. 798 (2017); Gregory S. Crawford, Robin S. Lee, Michael D. Whinston, and Ali Yurukoglu,, The Welfare Effects of Vertical Integration in Multichannel Television Markets (Nat'l

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organization (IO) in economics (especially the branch known as "structural IO") is a factory for producing these new methodologies which are then quite rapidly or even concurrently employed in merger reviews.[125]

An analogous set of tools has developed in structural labor economics, to some extent influenced by the developments in IO. While structural modeling is common in models of dynamic monopsony,[126] these models tend to assume a large number of firms and are thus unsuited to merger analysis.

But there is no technical reason why the models developed for analysis product markets cannot be applied to the labor market. The monopsony model proposed by David Card and coauthors[127] adapts a workhorse model of demand estimation to the labor market. Dynamic discrete choice models of schooling and work have been developed by Michael Keane and Kenneth Wolpin.[128] More sophisticated variants, including nested labor market supplies (e.g. first choose an occupation, then a location, then a firm) as well as allowing heterogeneous tastes for particular workplaces could be incorporated relatively easily.

Labor demand modeling, recovering marginal products of workers, is also likely no more or less challenging than modeling costs of firms in the product market. Predictions about merger effects on wages could then be obtained by estimating a labor supply system to firms, recovering the implied observed and predicted markdowns, and applying predicted markdowns to predicted marginal labor productivity.

On the other hand, models of *employer* behavior in labor markets are generally more primitive than of producer behavior in industrial organization. Bringing state-of-the-art merger analysis to labor markets would require pairing the sophisticated analyses of labor supply and worker behavior with models analogous to those applied in industrial organization to firm behavior. While we have not explicitly developed such models ourselves and are not aware of work on them at present, in principle we see no fundamental challenges impeding such analysis beyond those that have been overcome in IO. Many of the same tools, in terms of production function estimation, estimation of games such as differentiated products price competition and so forth could be directly imported. Some of the more sophisticated dynamic elements might differ between product and labor markets because of the long-term nature of employment relationships, but again the well-developed analysis of worker behavior from structural labor economics could likely be used.[129]

Bureau of Econ. Research, Working Paper No. 21832, 2017); Gautam Gowrisankaran, Aviv Nevo, and Robert Town, Mergers When Prices are Negotiated: Evidence from the Hospital Industry (Nat'l Bureau of Econ. Research, Working Paper No. 18875, 2014).

[125] E. Glen Weyl, Finance and the Common Good (unpublished, 2016), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2271832.

[126] See, e.g., Fabien Postel-Vinay & Jean–Marc Robin, Equilibrium Wage Dispersion with Worker and Employer Heterogeneity, 70 Econometrica 2295 (2002).

[127] Card et al., supra note __.

[128] Michael P. Keane & Kenneth I. Wolpin, The Career Decisions of Young Men, 105 J. Pol. Econ. 473 (1997).

[129] A pioneering example of this sort of work is Jeremy Fox's 2010 paper. He estimates a dynamic job shopping model for engineers using maximum likelihood, recovering a distribution of switching costs across engineers showing the potential for structural empirical methodologies to be used to simulate merger counterfactuals in the labor market. See

D. Other Factors in Merger Analysis

In the previous section, we mentioned that later-stage merger analysis of product markets uses sophisticated formal economic models and discussed how later stage analysis of mergers for labor markets might do the same. But in both cases, formal economic models cannot answer all questions; they must be supplemented by informal analysis of factors that the models exclude. These factors include efficiency gains of mergers, extensive margins of competition (entry into the market), and external influences on firm conduct. Such informal analysis is already common for product market effects of mergers. Informal analysis is even more important for labor markets than for product markets because, as we noted above, formal models of many important features of labor markets for merger analysis have not yet been developed. Here, we apply some of these factors to labor market analysis, pointing out where modification may be required.

1. Efficiencies

The most important factors considered at this stage of merger analysis are "efficiencies" that may make the merger beneficial despite its anticompetitive effects. Such efficiencies fall into three major categories: productive efficiencies associated with economies of scale or network effects; contracting efficiencies and other ways in which the merger may reduce market power or facilitate commerce; and what might be called "viability efficiencies," referring to the possibility that one merging party might exit the market or become unviable as a competitor in the absence of the merger, in which case the merger merely hastens that party's exit from the scene.[130] While these efficiencies are sometimes quantifiable, they are typically addressed in qualitative fashion.

Just as product cost may fall with an efficiency-enhancing merger, labor productivity could increase. For example, a single large factory might be able to produce airplanes more efficiently than two small factories because the large factory can subdivide the assembly line so as to achieve greater gains from labor specialization. The increase in labor market productivity may cause labor demand to increase or decrease, depending on the structure of the product market.

Under the Merger Guidelines, the merging firms are permitted to argue that the efficiencies justify a merger that otherwise would be deemed anticompetitive.[131] However, this type of defense is subject to two important limits. First, the "consumer welfare" standard implies that the efficiency gain must be large enough that on net consumer welfare increases despite an increase in market power.[132] In contrast, if consumers lose on net, the efficiency does not count in favor of the merger even if the firms' profits are greater than the consumers' loss. Thus, for example,

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Jeremy T. Fox, Estimating the Employer Switching Costs and Wage Responses of Forward-Looking Engineers, 28 J. Lab. Econ. 357 (2010).

[130] See Herbert Hovenkamp, Appraising Merger Efficiencies, 24 Geo. Mason L. Rev. 703 (2017).

[131] Horizontal Merger Guidelines, supra note __, at § 10.

[132] See F.T.C. v. Univ. Health, Inc., 938 F.2d 1206, 1223 (11th Cir. 1991); 4A Phillip E. Areeda & Herbert Hovenkamp, Antitrust Law ¶ 971, at 41 (2016) (efficiencies generated by the merger must be passed on to the consumer to a sufficient extent that, despite anticompetitive effects, "the post-merger price is no higher than the pre-merger price.").

mergers that only reduce each firm's fixed costs but do not reduce the marginal cost of production, and hence lower prices, would be banned. [133]

Second, the relevant efficiencies must be *merger-specific* in the sense that they are possible, or possible at reasonable cost, only through the merger. [134] For example, if there are two wireless carriers who could and naturally would (but for the prospect of a merger) interconnect their networks so that subscribers to both carriers could benefit from the network of the other, these carriers could not use the prospects of broader shared networks as a merger defense. If the carriers can connect their networks at reasonable cost through contract, then cannot claim that a merger is necessary.

Most of the principles naturally carry over, in suitably modified form, to the analysis of merger effects on labor markets, though a few subtle issues arise. Many of the same factors that could act as efficiencies on the product side are also efficiencies on the labor side. By analogy to the "consumer welfare" standard, we believe that mergers that trigger scrutiny by reducing labor market competition should be subject to a "worker welfare" standard. [135] The fact that the merger might raise firm profits more than it harms workers *should not* be sufficient to excuse the merger. Instead, the merger would be permitted if the merger sufficiently increases worker productivity (workers' marginal revenue product) in a way that will not fully be absorbed by lower prices or increased employer profits. Thus, harms from reduced competition are more than fully offset and therefore workers' wages, benefits, or conditions will improve because of the merger.

This is not to say that mergers that harm workers should never be approved. The losses to workers could be offset by gains elsewhere in the economy. Indeed, the merger of two firms that operate in a frictionless labor market should not greatly harm workers even if it does result in significant layoffs, because in a competitive labor market the laid-off workers can easily find equally good jobs. In contrast, a merger that *does* create competitive concern should not be excused simply on the basis that it allows the firm to cut costs by destroying jobs. In such cases, antitrust doctrine does not allow efficiency gains in other markets to offset losses in one market. [136] Thus, typically, the worker surplus implications of a merger will indicate its competitive effects, just as in product markets consumer surplus is a strong but not perfect proxy for competitive effects.

In some cases a merger may prove overall competitively harmful in labor markets (viz. harm worker welfare) and beneficial in product markets (viz. benefit consumer welfare). Such cases should be treated roughly like ones where competitive harm occurs in one product market but there are competitive benefits in another product market. To the extent possible, antitrust authorities should try to find remedies that address the competitive harms while preserving the benefits, such as requiring the spinning off of critical units that would allow an increase in market power. However, the frequency of such cases should not be exaggerated; mergers that increase labor market power and thus raise effective costs will not typically or usually bring lower prices to consumers, and mergers increasing product market power and thus reducing sales will not typically create great jobs. Similar analysis applies to the merger-specificity of the efficiency

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[133] Mark Armstrong & John Vickers, A Model of Delegated Project Choice, 78 Econometrica 213 (2010).

[134] Horizontal Merger Guidelines, supra note __, at § 10.

[135] Cf. Masterman, supra note __, at 1416.

[136] 4A Areeda & Hovenkamp, supra note __, at ¶ 971, at 41.

gains: productivity gains that could be achieved absent the anticompetitive effects of the merger should not play a role in merger analysis.

The second broad category of efficiencies typically considered in mergers relate to the so-called "double marginalization problem" and other complementarities in the production or consumption of the products of the merging firms. Firms that supply complementary products to a consumer or that supply intermediate inputs to each other may, absent a merger, each demand a mark-up on their own product, leading to the stacking of mark-ups in a manner that reduces both firm profits and consumer welfare.[137] A recent example is the providers of premium cable channels, often regional sports networks, which have sometimes merged with cable companies. Recent research has found that such mergers generally lead to lower marginal channel prices for consumers purchasing from the merging cable company because the internalization of the channel provider's profits by the cable company induces lower prices (though such mergers may also have anticompetitive foreclosure effects).[138]

Such mergers are said to have a "vertical component" as well as the "horizontal component" that causes antitrust concern. For example, a household paper goods firm mostly complements a grocery store that sells a high volume of its products but may also compete with a house brand of the grocery store. A merger may thus both have vertical benefits and horizontal harms that must be balanced to determine the net competitive effect. Matters are similar in labor markets. Jobs may be complementary to each other directly because workers are complementary. For example, the researchers at a company that mostly invents new products may be more productive if they merge with another company that is focused on commercialization of new products. The two groups of workers may be able to interact with each other and cooperate more closely if they work for the same firm than if they work for different firms, even if those firms cooperate via contract.

There may also be less direct complementarities. For example, engineers with an expertise in materials may not directly collaborate with electrical engineers but having them around the office may help spark creativity during lunchtime conversations and thus a merger of two engineering firms may increase the productivity and thus wages of both types of workers. A merger of these two companies may be highly pro-competitive even if the two engineering teams from different firms could go out to local restaurant together in any case, because the merged firm internalizes the extra productivity each group of workers brings to the other. The enhanced productivity will result in higher wages for both engineering teams. Such vertical benefits of a merger between employers must be weighed against the fact that, for example, they may compete in the market for engineers without a clear specialization in that location.

The final, viability efficiency consideration that arises in many mergers is the possibility that, but for the merger, one of the merger partners would go out of business or otherwise would become an ineffectual competitor in the market. This issues often arises for firms that are either near bankruptcy or that are losing money in some critical markets. To the extent that it can be clearly demonstrated that absent the merger the firm would exit and that the competitive harm of

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[137] See, e.g., Géarard Gaudet & Ngo Van Long, Vertical Integration, Foreclosure, and profits in the Presence of Double Marginalization, 5 J. Econ. & Man. Strategy 409 (1996).

[138] Crawford et al., supra note __.

the merger is less than that of exit by the failing firm (or that the merger could strengthen the competitive position of the non-failing merger partner), the merger will typically be allowed to proceed. In labor markets similar arguments may be relevant: that an employer would otherwise "ship the factory to China" may be used to defend a merger. However, as in product markets, it will usually be necessary to demonstrate that there was no other feasible route to stabilize the profitability of the business, such as selling it to an alternative purchaser who is not a direct competitor.

2. Repositioning, Entry, and Potential Competition

While efficiencies are the most prominent factor in late-stage product-market merger analysis, other considerations also play a role. In the interests of space, we will discuss the role of some of these other considerations in merger analysis involving labor markets.

One of the most prominent such factor is *product repositioning*, changes to the non-price characteristics of products that the merger may provoke.[139] The ability of other firms in the market to reposition their products in response to the merger of two firms whose products are close substitutes may mitigate some of the harms of a merger. For example, the merger of Whole Foods and Wild Oats, two gourmet organic grocers, may lower the quality of the organic food the merged firm offers because they are no longer competing for core consumers. However, other grocers may well upgrade their products to muscle in on the territory vacated. This effect can only reduce anticompetitive harms from the merger, not eliminate them.

Similar considerations apply to labor markets. If a merger of the two largest coal mines in a region leads to widespread unemployment of coal workers, other companies may reposition their jobs to take advantage of coal workers' unique skills (such as the ability to deal with extreme conditions). Conditions of work, classifications of workers, flexibility, sick leave and so forth vary so widely that non-wage amenities are likely to be a critical way in which employers who gain market power through mergers will exercise this power. Thus, we expect analysis of job repositioning to be even more important in labor markets than analysis of product repositioning is in product markets.

Mergers (and especially anticompetitive mergers) tend to encourage firm *entry*. To the extent that the merging firms raise prices and compete less intensely, they leave profit opportunities for a new firm to exploit. In principle, this tendency to encourage entry may be a reason for excusing the anticompetitive effects of entry. Some commentators, however, are skeptical that firms can enter markets as easily as this theory suggests.

Whoever is right, this argument is even weaker for labor markets. The extensive labor market frictions deter entry. In the product market case, a firm can enter a market merely by supplying products identical or similar to those being sold by the merged firm. In the labor market case, a firm can in principle enter a market by hiring workers laid off by merging firms, but the new entrant will need to duplicate hard-to-observe workplace conditions that may have attracted the workers originally, and also contend with a workforce that was demoralized by the earlier

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[139] See, e.g., Amit Gandhi, Luke Froeb, Steven Tschantz, & Gregory J. Werden, Post-Merger Product Repositioning, 56 J. Indus. Econ. 56: 49 (2008).

layoffs. Case law and views within the economics community have largely drifted in this direction.[140]

Another increasingly important factor in the analysis of mergers in product markets is their effect on *potential* competition. Instagram may not have directly competed with Facebook at the time Facebook purchased Instagram, but Facebook may have been rightly concerned that Instagram might, if left to itself, succeed in reorienting the social media landscape around images rather than the image-text mixture that Facebook has profited from.

Purchases to forestall potential competition may also take place when firms fear competition in the labor market. In recent years, tech companies have rushed to hire programmers who specialize in machine learning. A common way of acquiring such talent is to purchase machine learning start-ups: Google bought DeepMind, Microsoft bought Maluuba, Apple bought Lattice Data. In contrast, the tech companies could have tried to hire workers directly by luring them with promises of high compensation from the incumbent employers. It seems likely that the share of the gains accruing to workers (as opposed to investors and the few at the top of these start-ups) from open competition would have been greater than under an acquisition strategy. The acquisition thus effectively killed off potential competition for workers. Analyses of potential labor market competition, especially in highly dynamic labor market, should form an important part of antitrust analysis of the labor market harms from mergers. This type of threat may not be easily gauged by the standard MDC and UPP/DWP approaches which focus on the present state of competition rather than the future competitive landscape.

E. Case Study: The Effect of Hospital Mergers on the Labor Market for Nurses

To give a sense of how our merger approaches would work in the real world, we provide a brief example that uses real-world data, albeit in a hypothetical setting. We use the example of nursing because a considerable amount of work on the topic has yielded fine-grained data on which we can rely.

Suppose two hospitals, each with one third of the nurses in a particular labor market area, propose a merger. Should the government block the merger because of its labor market effects? We can use existing evidence to calculate the predicted fall in nurse wages, and check if the three approaches we have discussed generate results consistent with the evidence.

MDC. The merger would increase the HHI from 3333 to 5556, for a difference of 2223.[141] Under the Merger Guidelines, the proposed merger would be presumptively blocked because of the high initial HHI and the high increase in HHI. Barry Hirsch and Edward Schumacher estimate the effect of hospital concentration on nurses' log wages, and find (when controlling for fixed effects) that the coefficient on hospital concentration is -0.4, which implies that the merger would lower nurse wages by almost 9%.[142] If we instead use a more recent study by Azar, Marinescu and

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[140] See Joseph Farrell and Michael K. Katz, The Economics of Welfare Standards in Antitrust, 2 Competition Policy International 3 (20.06)

[141] The pre-merger HHI is $3 * 1/3^2 = 0.3333$. The post-merger HHI is $2/3^2 + 1/3^2 = 0.5556$.

[142] Barry T. Hirsch & Edward J. Schumacher, Classic or New Monopsony? Searching for Evidence in Nursing Labor Markets, 24 J. Health Econ. 969 (2005).

Steinbaum, who find a log HHI point estimate of -0.12 (and a mean baseline HHI of 0.3), the implied increase in HHI would decrease wages by 20%.[143] Thus, given an average salary of $68,500 per year for registered nurses,[144] the merger would lower their salary by $6,165-13,700 while also eliminating some jobs. The hospitals could try to rebut by showing that efficiency savings would allow them to raise wages. It is possible, for example, that nursing labor can be used more efficiently in one hospital than in two, but the merging hospitals would need to prove an efficiency gain of sufficient magnitude.

DWP. In a symmetric merger, the UPP reduces to m*D, where D is the diversion ratio and m is the markup. Some algebra reveals that the analogous measure for the labor market case would be the same, m*D, with m now the markdown. Staiger, Spetz, and Phibbs estimate a residual labor supply elasticity facing the hospital of 0.1,[145] which would imply a markdown of 10, and the symmetry of the merger would imply D = 0.5, and so DWP =.5*10=5. Hence labor productivity would have to more than double after the merger in order to keep wages constant in this example. Again, the burden would be on the merging hospitals to prove this efficiency gain.

If we instead used the cross-wage elasticity (effect of other hospital's wage on own employment) of 0.028 implied by the VA wage effect on nearby non-VA hospitals studied by Staiger, Spetz, and Phibbs,[146] the Diversion Ratio would be .028/.1=.28 and this would imply a DWP =10*.28/= 2.8. Both of these DWP numbers are far larger than the minimum required to trigger merger scrutiny.

The magnitude of DWP for a hospital merger depends on the residual labor supply elasticity of nurses and other health care workers. Table 2 shows DWP across a range of nurse (and nurse-aide) residual labor supply elasticities from the literature. The estimates of residual labor supply curves vary widely in this literature. The article with the most credible identification strategy shows the lowest.[147] Table 2 shows DWP predictions under both high and low estimates of the cross-elasticity, and across the range of own-elasticities. For the ranges of residual supply elasticities below 3.5, the DWP predictions for a symmetric merger suggest that scrutiny would be warranted under the current guidelines. Even with larger residual labor supply elasticities from Sullivan,[148] the DWP is greater than 0.01. Of course, as the degree of market power falls, the DWP falls, and there are estimates of nurse[149] and nurse aide residual supply elasticities[150] that would imply a DWP below any meaningful threshold. This strongly suggests that many hospital mergers should be carefully watched for labor market effects, in sharp contrast to the status quo.

Table 2

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[143] Azar et al., supra note __.

[144] Bureau of Labor Statistics, Registered Nurses Median Pay (2016), https://www.bls.gov/ooh/healthcare/registered-nurses.htm.

[145] See Staiger, Spetz, and Phibbs, supra note __.

[146] Id.

[147] Id.

[148] Sullivan 1989.

[149] See K. Hansen, Testing for Monopsony in the U.S. Nursing Market, Mimeo, University of Rochester, unpublished 1991.

[150] See Matsudaira, supra note __.

			Diversion Ratios and Downward Wage Pressure from Merger of Ex-ante Symmetric Firms		
Own-Elasticity	Cross-Elasticity	Div. Ratio	DWP (DR*markdown)	Own Source	Cross-Source
0.183	0.028	0.15301	8.4E-01	Staiger et al Table 6, Column 6	Staiger et al Table 6, Column 6
1.26	0.028	0.02222	1.8E-02	Sullivan 1989 Short-run	Staiger et al Table 6, Column 6
3.85	0.028	0.00727	1.9E-03	Sullivan 1989 long-run	Staiger et al Table 6, Column 6
29	0.028	0.00097	3.3E-05	Hansen 1992 Lower End	Staiger et al Table 6, Column 6
56	0.028	0.00050	8.9E-06	Hansen 1992 Upper End	Staiger et al Table 6, Column 6
1000	0.028	0.00003	2.8E-08	Matsudaira 2012 approximation	Staiger et al Table 6, Column 6
0.199	0.116	0.58291	2.9E+00	Staiger et al Table 6, Column 3	Staiger et al Table 6, Column 3
1.26	0.116	0.09206	7.3E-02	Sullivan 1989 Short-run	Staiger et al Table 6, Column 3
3.85	0.116	0.03013	7.8E-03	Sullivan 1989 long-run	Staiger et al Table 6, Column 3
29	0.116	0.00400	1.4E-04	Hansen 1992 Lower End	Staiger et al Table 6, Column 3
56	0.116	0.00207	3.7E-05	Hanse 1992 Upper End	Staiger et al Table 6, Column 3
1000	0.116	0.00012	1.2E-07	Matsudaira 2012 approximation	Staiger et al Table 6, Column 3

Calculations done assuming each of 2 merging firms has 1/3 of the market and hourly wage of 10.

Merger simulation. While it is beyond the scope of this paper to conduct a merger simulation for the effect of a hypothetical hospital merger on the wages of nurses, it is quite feasible. Data on hospital employment of different types of nurses (in hours) and hourly wages are already publically available for the state of California. This is precisely the raw material required to estimate a "labor supply system" analogous to widely used "labor demand system" estimation used for conducting merger simulations (for example the widely used Berry-Levinsohn-Pakes methodology[151]). Further, demand system estimates often require instruments with sometimes dubious exogeneity assumptions, but labor economists regularly use exogenous product price shocks to identify residual labor supply curves. With the kind of detailed data available to regulators, there are no obstacles to deploying the full IO toolkit for conducting merger simulations in the labor market for nurses.

Defenses. Because we have never seen an attempt to justify anticompetitive labor market effects of mergers, it is hard to know what efficiencies merging partners would attempt to bring to bear. One possibility, noted above, is that a merger could reduce redundancy. Another possibility would be increased productivity because of greater ease of medical record sharing or cross-hospital referrals. The merging parties would have to show that these were likely to increase wages and could not be achieved without a merger. Other informal factors seem important here, especially changes to hours, benefits, and job descriptions, as these can be highly specific to a particular hospital and nurses can be asked to work odd hours. Given large economies of scale in hospitals and often the necessity of affiliating with a major university, we doubt that entry analysis would play a large role in this case, nor potential competition. However, the prospect of coordinated effects might be important given the close geographic proximity of hospital and their frequent communication about community health, which may serve as a ruse for collusion on wages.

In short, the tools already used by antitrust regulators to predict the product-market price effects of mergers can be readily applied to predicting their labor-market wage effects. Using available estimates of hospital market power in the nursing market and existing antitrust heuristics,

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[151] See Steven Berry, James Levinsohn, & Ariel Pakes, Automobile Prices in Market Equilibrium, 63 Econometrica 841 (1995).

we guess that the wage effects of hospital mergers are substantial, suggesting that antitrust regulators should subject them to an additional level of scrutiny.

III. Legal Remedies for Other Types of Monopsonistic Behavior

A. Covenants Not to Compete

Covenants not to compete, also called non-compete agreements, provide that if an employee quits or is fired from a job, she may not work for a rival employer. Non-competes typically define an industry, geographic scope, and time limit. In the common law, courts scrutinize non-competes and refuse to enforce them if they are "unreasonable," meaning that they are stricter than necessary to protect the employer's legitimate interests, such as trade secrets or investments in training.[152] Despite the explicit restrictions on competition, courts have been unsympathetic to claims that non-competes may violate the antitrust laws.[153]

As we noted in the Introduction, concerns have been growing in recent years that non-competes are used not just for legitimate means, but to suppress competition. The widespread inclusion of non-compete clauses in the contracts of low-skilled workers, including sandwich-makers who work for chains, suggests that they are being used to raise the cost for workers of quitting and working for a competitor. Aside from the immediate hardship for workers, the extensive use of non-competes may further concentrate labor markets. To see why, imagine that a single firm (or small group of firms) dominates a labor market in a geographic area. If the firm uses non-competes, then new firms will be deterred from entering the labor market because they will have trouble hiring workers. Thus, the non-compete may be used to consolidate or extend labor market power.

The traditional common law analysis of non-competes misses these effects because the court is not required to look at market power. The analysis is focused on the possible hardship on the worker who is subject to the non-compete. But the problems created by non-competes are much broader. If a labor market monopsonist uses non-competes, it can deter other firms from entering the labor market and offering superior wages and working conditions to workers. Thus, the social cost of a non-compete does not depend on its effect on a particular worker (who in principle could be compensated in the form of higher wages for entering it) but on the broader labor market—and, specifically, on the extent of the labor market power of the employer. Indeed, consistent with this theory, Starr et al. find that non-competes make workers worse off in monopsonistic markets but not in competitive markets.[154] This calls for antitrust analysis rather than common law analysis.

Antitrust law already contains the conceptual resources for addressing this problem. For a product market analogy, consider an exclusive dealing arrangement. If a large seller with product

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[152] See Restatement (Second) of Contracts § 186 (1981).

[153] See, e.g., Eichorn v. AT & T Corp., 248 F.3d 131 (3d Cir. 2001), as amended (June 12, 2001) (upholding a no-hire agreement between AT&T and the buyer of a subsidiary; the court characterized the no-hire agreement as a covenant not to compete, which it upheld because of its limited scope despite the anticompetitive effects); McDonald v. Johnson & Johnson, 722 F.2d 1370, 1378 (8th Cir. 1983) (similar).

[154] Starr et al., supra note __, at 28.

market power sells only to distributors who agree not to sell the products of rival sellers, then the initial seller would be able to strengthen its position in the market against possible rivals. For this reason, an exclusive dealing arrangement can be, and are frequently challenged, under the antitrust laws.[155] For example, courts have found that exclusive dealing relationships between firms with market power and independent contractors violate the antitrust laws.[156] The same analysis should apply to covenants not to compete as well.

B. Supplier Wage Suppression

Nathan Wilmers has found evidence that large buyers like Walmart have tried to control the wages that their suppliers pay their (the suppliers') workers.[157] His research indicates that when suppliers sell to a concentrated retailer such as Walmart, overtime wages of their workers fall. While the exact mechanism of this effect is unclear, one possibility is that large retailers require their suppliers to pay workers below some firm-imposed cap to reduce competition for workers among the suppliers, enabling suppliers to pass on labor cost savings to the retailer.

If this speculative account is correct, then firms like Walmart are engaging in anticompetitive behavior that has harmed workers. Walmart's behavior is the mirror-image of resale price maintenance, where a seller (like a manufacturer) requires its customers (wholesalers or retailers) to sell goods at a price above a set amount. When the seller has market power, the effect of its behavior is to orchestrate a cartel among the customers, who charge the set price rather than compete on price. Supplier wage suppression results in an effective cartel among suppliers, who are able to pay their workers below the marginal product, and pass on some of the savings to the buyer. Supplier wage suppression should similarly be considered a violation of the antitrust laws.

C. Collusion

Courts and regulators have already recognized that collusion in labor markets violates the antitrust laws. Firms may be held liable for agreeing to fix wages and sharing wage information so as to facilitate coordination of wages.[158] They have also been held liable for agreeing not to make employment offers to each other's workers ("no-poaching agreements," "no-switching

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[155] Stanley I. Ornstein, Exclusive Dealing and Antitrust, 34 Antitrust Bull. 65 (1989).

[156] See Le v. Zuffa, LLC, 216 F. Supp. 3d 1154, 1167 (D. Nev. 2016) (martial arts promoters with significant market power may have violated antitrust laws by requiring fighters to sign indefinite exclusive dealing agreements). See also Christou v. Beatport, LLC, 849 F. Supp. 2d 1055, 1064 (D. Colo. 2012) (where plaintiff night clubs allege that defendant website and night club operator threatened DJs who offered to work for plaintiffs. While the DJs were not parties, the coercion used against them provides another example of anticompetitive behavior toward a labor market).

[157] Nathan Wilmers, Wage Stagnation and Buyer Power: How Buyer-Supplier Relations Affect U.S. Workers' Wages, 1978-2014 (unpublished manuscript, 2018).

[158] For a discussion of this theory, see Cason-Merenda v. Detroit Med. Ctr., 862 F. Supp. 2d 603 (E.D. Mich. 2012) (allowing nurses to prove collusion through information-sharing).

agreements") and related activities.[159] In 2010, numerous high-tech firms that had agreed not to poach each other's employees settled with the Justice Department.[160]

In a variation on this practice, franchisors have increasingly prohibited franchisees from competing for workers. More than half of major franchisors engaged in this practice as of 2016, up from about a third in 1996.[161] In 2017, McDonald's employees sued the company for blocking franchisees from hiring each other's workers.[162] Franchises have in the past been able to avoid antitrust liability under the single entity doctrine.[163] If a franchise is defined as a single company, rather than a collection of companies, then collusion is impossible, since collusion involves more than one entity acting in cooperation.[164] However, from a policy standpoint, the only question is whether multiple franchisees in a single labor market possess market power, and hence can suppress wages by colluding. If they can, it should be irrelevant that they are nominally controlled by a single franchisor.

D. More Speculative Anticompetitive Practices in Labor Markets

Courts have recognized other anticompetitive practices in product markets that have parallels as well in labor markets. Although we are unaware of any cases or allegations of the labor-market behavior, it is worthwhile to explore the parallels.

Predatory pricing / predatory hiring. A seller with market power may find it profitable to charge customers below-market prices in order to bankrupt an entrant into a market, then charging above-market prices after that firm disappears. In a typical pattern, a monopolist charges high prices until the entrant materializes, then charges below-market prices to prevent the entrant from acquiring customers, doing so long enough to force the entrant to quit the market, and then raising prices again. While predatory pricing can be difficult to prove, it constitutes illegal anticompetitive behavior.[165]

If predatory pricing is a rational strategy of a monopolist, then "predatory hiring" is a rational strategy of a labor monopsonist. Imagine that a large employer—say, a hospital—in a small town pays nurses a below-market wage. A new firm enters the market, hoping to attract nurses by charging them a market wage. The incumbent responds by raising wages above the workers' marginal revenue product, drawing on its earlier monopsony profits to fund the

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[159] See Michael Lindsay & Katherine Santon, No Poaching Allowed: Antitrust Issues in Labor Markets, 26 Antitrust 73 (2012). See, e.g., Jung v. Ass'n of Am. Med. Colleges, 300 F. Supp. 2d 119 (D.D.C. 2004) (coordination among medical residency programs); Cason-Merenda v. Detroit Med. Ctr., 862 F.Supp.2d 603, (E.D. Mich. 2012) (coordination among hospital against nurses).

[160] U.S. Dep't of Justice, Office of Public Affairs, Justice Department Requires Six High Tech Companies to Stop Entering into Anticompetitive Employee Solicitation Agreements (Sept. 24, 2010), https://www.justice.gov/opa/pr/justice-department-requires-six-high-tech-companies-stop-entering-anticompetitive-employee.

[161] See Card & Krueger, supra note __; Posner & Krueger, supra note __.

[162] Class Action Complaint, Deslandes v. McDonald's USA, LLC et. al, No. 1:17-cv-04857 (N.D. Ill. filed June 28, 2017), https://www.courthousenews.com/wp-content/uploads/2017/06/McDsPoaching.pdf.

[163] See, e.g., Williams v. I.B. Fischer Nevada, 999 F.2d 445, 447-448 (9th Cir. 1993).

[164] For a discussion, see Michael Lindsay & Katherine Santon, No Poaching Allowed: Antitrust Issues in Labor Markets, 26 Antitrust Bull. 73 (2012).

[165] See Brooke Grp. Ltd. v. Brown & Williamson Tobacco Corp., 509 U.S. 209, 226 (1993).

temporarily loss-producing strategy. The new firm quits the market because it cannot hire nurses at the market wage; then the incumbent lowers wages or worsens working conditions. The incumbent's behavior would constitute predatory hiring, and should be considered unlawful for the same reasons that predatory pricing is.

Vertical foreclosure. Antitrust law takes a more relaxed attitude toward vertical mergers than horizontal mergers because vertical mergers do not as frequently consolidate product markets. But certain vertical mergers pose risks. Suppose an upstream seller (a manufacturer or other supplier) possesses market power and merges with one of two (or a few) downstream buyers. The merged firm then sells to the other downstream buyer (or buyers) at an elevated price, giving itself (in its capacity as downstream firm, the result of the merger) a competitive advantage. This is known as foreclosure and is illegal under the antitrust laws.

Downstream product and labor markets behave similarly in this case. Suppose the market for nurse aides has two hospitals in it, both of which serve patients covered by the same HMO. Now suppose the HMO acquires hospital 1, and lowers reimbursement rates for patients served at hospital 2. This will lower labor market demand for nurse aides in hospital 2, and give hospital 1 the ability to lower wages for its own nurse aides.

IV. Conclusion

Labor market power is ubiquitous and costly to society. It is bad for economic growth, equality, and well-being. Yet labor market power is generally ignored by antitrust authorities, and never considered as a justification for subjecting mergers to scrutiny. This contrasts with the regulatory concern for product market power. We argue that this asymmetry is not justified by either legal doctrine or economic theory, and suggest that applying the economic analysis of product markets regularly deployed in the scrutiny of mergers can easily be applied to the labor market.

It is also worth considering whether more severe corrective action in labor markets, given their current highly concentrated state, may be called for. In the nineteenth century, years without antitrust led to a business landscape dominated by a small number of highly powerful trusts. After the Sherman Act was passed, and the political will could be mustered, several of largest trusts were broken up. Our present business landscape exhibits a number of extremely powerful employers as a result of the neglect of mergers and other anticompetitive behavior in labor markets. While a more detailed examination would be needed to draw any firm conclusions, antitrust investigations into massive employers (such as Compass Group, Accenture,[166] Amazon, Uber and Walmart), as well as platform-based firms that receive vast flows of valuable data services without any compensation (such as Facebook and Google), seem warranted.[167] It may be that some of these firms have achieved such powerful monopsonies that they should be broken up.

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[166] Lauren Weber, Some of the World's Largest Employers No Longer Sell Things, They Rent Workers, Wall Street Journal (Dec. 28, 2017).

[167] Imanol Arrieta Ibarra, Leonard Goff, Diego Jiménez Hernández, Jaron Lanier, & E. Glen Weyl, Should We Treat Data as Labor? Moving Beyond 'Free,' 1 Am. Econ. Ass'n Papers & Proceedings (forthcoming 2018).