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Chairman, Ranking Member, and Members of the Subcommittee, thank you for inviting me to testify today. My name is Ioana Marinescu and I am an Assistant Professor at the School of Social Policy and Practice, University of Pennsylvania. I am a faculty research fellow at the National Bureau of Economic Research. I have written many academic articles focusing specifically on competition in labor markets, including economics and law articles. I have been invited to speak about my research on competition in labor markets at the Federal Trade Commission in 2018, and at the Department of Justice Antitrust Division in 2019.

In my testimony, I will make four points:

1. **Employers can suppress wages due to limited competition in the labor market**. Simply put, workers cannot easily find alternative jobs in response to wage decreases (Azar, Berry, and Marinescu 2019). This allows an employer to pay a worker less than the marginal revenue product—the amount of value that the worker adds to the employer's bottom line
2. **The majority (60%) of US labor markets are highly concentrated** (Azar et al. 2018), i.e. they have a Herfindahl-Hirschman index (HHI) above the 2,500 high concentration threshold established by the Horizontal Merger Guidelines.
3. **Higher labor market concentration tends to lower wages** (Azar, Marinescu, and Steinbaum 2017). For example, hospital mergers decrease wages by increasing labor market concentration (Prager and Schmitt 2018). Workers in concentrated labor markets are underpaid, so there is room to increase the minimum wage without reducing employment (Azar et al. 2019).
4. **Antitrust enforcement in labor markets should be strengthened**. There is currently a large antitrust enforcement gap between product and labor markets, with labor antitrust lagging behind (I. E. Marinescu and Posner 2019). Yet, it is straightforward to take into account anticompetitive effects on the labor market in merger reviews (I. Marinescu and Hovenkamp 2018). Legislative action could facilitate antitrust enforcement in the labor market by codifying, clarifying, and in some cases strengthening the antitrust law (I. Marinescu and Posner 2019).

Employers can suppress wages due to limited competition in the labor market

When employers establish wages and working conditions, they seek to minimize their labor costs while attracting the workers they need in the production process. In a perfectly competitive labor market, where workers can at no cost quit and obtain comparable work at alternative employers, the employer pays a

wage equal to the worker's marginal revenue product—the amount of value that the worker adds to the employer's bottom line. Such a wage "clears" the market, attracting all workers willing to work in return for it, and thus can be taken as a baseline for evaluating actual labor market conditions.

Real-world wages deviate from the competitive ideal when workers have limited alternative job options. The most direct measure of employers' labor market power – also called monopsony power -- is the labor supply elasticity, which refers to workers' sensitivity to wages. An infinite elasticity means that a worker will quit (or not take a job) if the wage is reduced even a tiny amount below the competitive wage, while an elasticity of zero means that a worker will stay put (or still take a job) even if the wage is reduced significantly. Thus, an infinite elasticity would prevail in a perfectly competitive labor market while an elasticity of zero would prevail in a market with no effective competition.

Leveraging data on job applications from the large job board CareerBuilder.com, we estimate how sensitive workers are to wages when applying for jobs. This allows us to approximately measure the labor supply elasticity (Azar, Berry, and Marinescu 2019). Based on the labor supply elasticity, we can infer how much employers are able to underpay workers and define a labor market for antitrust purposes. In our model, workers apply to the best possible jobs for them, allowing different workers to have different job preferences. We define a labor market by an occupation, such as "accountants and auditors" (a SOC-6 occupation), and a commuting zone. The commuting zones are based on data from the 2000 Census on commuting patterns across counties to capture local economies and local labor markets in a way that is more economically meaningful than county boundaries. On CareerBuilder.com, 81% of job applications occur where the job applicant and prospective employer are within the same commuting zone (I. Marinescu and Rathelot 2018).

Workers first choose a labor market to apply to, and, second, they decide on the best job vacancy to apply to in their chosen market. We find **low labor supply elasticities**[1]**, indicating that the labor market is not perfectly competitive and employers have significant market power**. Our analysis shows that **workers produce about 17% more than their wage level**. Using the labor market equivalent of the well-known SSNIP test used in antitrust litigation, we show that **essentially all labor markets defined by an occupation and a commuting zone are valid antitrust markets**.

The majority of US labor markets are highly concentrated

Measuring labor market concentration requires no new tools or methods. We can measure labor market concentration using the Herfindahl-Hirschman Index (HHI), which is what regulators already use for product markets. HHI is equal to the sum of the squares of the market shares of each firm in the market. In this case, market shares are based on the share of job vacancies of all the firms that post vacancies in that market. HHI has become conventional in industry concentration measures and has been used in the government's Horizontal Merger Guidelines for some thirty-five years. The same HHI thresholds apply to both seller and buyer power. For example, an HHI above 1,500 is "moderately concentrated," an HHI above 2,500 is "highly concentrated," and a merger that increases the HHI by more than 200 points, leading to a highly concentrated market, is "presumed likely to increase market power."

To calculate an HHI for the labor market, the challenge is to determine a robust definition of a labor market. Based on our research (Azar, Berry, and Marinescu 2019), a commuting zone by 6-digit Standard

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[1] For other studies showing low labor supply elasticity, see also (Manning 2011) and (Dube et al. 2019).

Occupational Classification (SOC) by quarter is generally a relevant antitrust market. This would be, for example, accountants and auditors in the Washington DC commuting zone in the first quarter of 2011.

The selection of the time period is particularly important for the labor market because job seekers can only afford to be unemployed and looking for a job for a limited period of time. The median duration of unemployment is about 10 weeks in 2016 according to the Bureau of Labor Statistics. That is, unemployed job seekers typically are hired or drop out of the market within about one quarter. This is why it is presumptively sensible to calculate labor market concentration over a quarter.

Regulators can thus compute the HHI for the labor market based on vacancy shares in the commuting zone, 6-digit SOC, and quarter, using data from Burning Glass Technologies (http://burningglass.com/), EMSI (http://www.economicmodeling.com/) or Indeed (https://www.indeed.com/). Regulators can then use the thresholds from the Horizontal Merger Guidelines to make a prima facie case against a merger that significantly increases labor market concentration and runs the risk of anticompetitively suppressing wages or salaries.

To calculate the share of each firm among posted vacancies, we use data on all vacancies listed online in 2016 as collected by burningglass.com (Azar et al. 2018). We find that **U.S. labor markets tend to be highly concentrated, with an average HHI of 4,378, which is equivalent to 2.3 firms hiring in the case of equal number of job vacancies for each firm. Overall, 60 percent of labor markets are highly concentrated, having an index above 2,500 HHI**, which corresponds to four firms hiring with equal shares in hiring. These highly concentrated markets account for 20 percent of U.S. employment. Larger cities generally have lower labor market concentration while labor markets are more concentrated in rural areas (Azar et al. 2018).

Wages fall when labor market concentration increases

The term "monopsony" commonly refers to situations where a few companies dominate hiring in the labor market. Compared to a perfectly competitive labor market, monopsony leads to lower employment and lower wages. All else remaining equal, lower employment also entails lower production on the output (product) side. Ultimately, **imperfect competition in the labor market has the same kind of depressing effect on production as we see in cases of imperfect competition in the product market**. For the purpose of a merger review in labor markets, the most important question is whether a merger is likely to increase monopsony in a labor market, thus reducing wages and output.

To analyze the relationship between labor market concentration (HHI) and posted wages (Azar, Marinescu, and Steinbaum 2017), we use data from CareerBuilder.com, the largest online job board in the United States, matching millions of workers and firms. The occupations we cover include the most frequent occupations among CareerBuilder.com vacancies, plus the top occupations in manufacturing and construction. Compared to the BurningGlass data we used to calculate concentration for all occupations, the CareerBuilder data has the advantage of including better information on wages as well as information on the number of job applicants, which allows us to better tease out the relationship between wages and concentration.

We show that average posted wages are strongly and negatively correlated with labor market concentration as measured by HHI. However, this correlation alone cannot be counted as strong evidence

that higher concentration depresses wages in a causal sense, as wages in depressed labor markets also tend to be lower.

Instead of simply comparing different labor markets, we look at how changes in concentration within a given market over time affect wages. The data indicate that when labor market concentration increases, posted wages decrease. Furthermore, to account for economic conditions in each specific market, we must control for the number of job postings divided by the number of job applications, also called "labor market tightness" in economic jargon. Labor market tightness is a key determinant of wages because it measures the balance of supply and demand for labor in a market, and hence determines the bargaining power of workers and employers. Even after controlling for tightness, the impact of labor market concentration on wages remains negative and statistically significant. All of these tests show that the negative effect of concentration on wages is likely to be causal and not just driven by unaccounted for market conditions.

The size of the impact of labor market concentration on posted wages depends on the specific statistical model used, but on average, **a 10% increase in concentration is associated with a 0.3% to 1.3% decrease in wages**. Furthermore, **smaller cities are doubly disadvantaged by having higher levels of labor market concentration and by suffering more from any increase in concentration**. The negative impact of labor market concentration on wages is also present when using data on all US vacancies from Burning Glass Technologies (Hershbein, Macaluso, and Yeh 2019).

Using vacancy data gives the most accurate measure of competition for workers at a given point in time because it represents companies that are actively looking to hire. However, one can also use employment shares to measure labor market concentration: this includes companies that are not currently hiring, but has the advantage of drawing on data that is available and consistent over longer time periods. Increases in labor market concentration measured by employment share also lead to decreases in wages, as shown by a rich recent literature (Benmelech, Bergman, and Kim 2018; Rinz 2018; Lipsius 2018; Qiu and Sojourner 2019).

If labor market concentration suppresses wages below workers' marginal productivity, then the minimum wage has the potential to enhance worker income without reducing employment. And indeed, we show that **minimum wage increases tend to increase employment in the most concentrated labor markets** (Azar et al. 2019).

Strengthening labor antitrust enforcement: merger reviews and beyond

Antitrust law is embodied in statutes that broadly prohibit anticompetitive practices in any kind of market. The most important of these statutes are section 1 of the Sherman Act, which prohibits "restraints of trade," and section 2, which prohibits monopolization. The courts have acknowledged that the law applies to labor markets as well as to product and other markets, and on a number of occasions employers have been held liable for anticompetitive labor market practices or settled lawsuits that challenged such practices. However, antitrust cases involving labor market abuse have been exceedingly rare, far less common than product market cases (I. E. Marinescu and Posner 2019).

Yet, the evidence shows that labor market HHIs can be readily calculated and that increases in concentration can reduce workers' wages. Therefore, **some mergers may be unlawful because they injure competition in the labor market by enabling a post-merger firm to suppress wages or salaries**

anticompetitively (I. Marinescu and Hovenkamp 2018). In particular, **mergers that lead to large increases in concentration have been shown to decrease the wages of specialized personnel in the hospital industry: such mergers decrease wage growth by about 25%** (Prager and Schmitt 2018).

Typically, anticompetitive wage suppression goes hand in hand with the suppression of employment and output below the competitive level. Mergers that increase monopsony power have the indirect effect of increasing prices by suppressing output. Therefore, the consumer welfare standard is compatible with the condemnation of such mergers. However, in some cases, an increase in monopsony power may not decrease output and increase prices for consumers. For example, if both workers and employers have some bargaining power, an increase in monopsony power may chiefly result in workers' getting a smaller share of the pie, even if the size of the pie stays the same (Hemphill and Rose 2018). Hemphill and Rose make a strong case for antitrust enforcement broadening its focus beyond harm to consumers by examining the anti-competitive effects of mergers on trading partners, including consumers, workers, and other suppliers.

The **Federal Trade Commission and the Department of Justice antitrust division have indicated their willingness to strengthen enforcement of the antitrust laws in the labor market.** However, we have only seen a handful of labor antitrust cases so far. **Thus, the doctrine has not developed to a point where the outcome of a case can be predicted with reasonable confidence.** Private lawyers and antitrust agencies are reluctant to take on the challenge of labor market antitrust litigation in such adverse conditions. To address these problems, Eric Posner and I propose that Congress pass a bill that would facilitate antitrust litigation against labor market monopsonists (I. Marinescu and Posner 2019).

Our legislative proposal begins with a simple restatement of section 2 of the Sherman Act, except we replace "monopolize" and related words with "monopsonize," and add the term "labor market.": "It shall be unlawful for any employer engaged in commerce, in the course of such commerce, to monopsonize, attempt to monopsonize, or combine or conspire with any other person or persons to monopsonize, a labor market." We then define a labor market as well as labor market power. Finally, we define a set of anticompetitive behaviors that employers with market power are liable for. Such anticompetitive behaviors include mergers, the use of non-competition clauses and mandatory arbitration provisions.

Our **proposed bill would greatly enhance private antitrust litigation against labor market monopsonies by codifying, clarifying, and in some cases strengthening the law.** It does not represent a radical departure from existing law. Instead, we have for the most part taken doctrine and concepts that have been developed by courts for product-market litigation and applied them to the labor market side. Where we go beyond existing law, we do so mainly by establishing presumptions in favor of workers that employers are allowed to rebut. In this way, we preserve the unity and coherence of antitrust law.

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