FIRST SUPPLEMENT TO MEMORANDUM 2024-46

Antitrust Law: Status Update (Public Comment)

The staff has received additional public comments relating to the Antitrust Study.[1] This memorandum provides information about the commentors. The comments are attached as Exhibits to this memorandum. Additional public comments received will be provided in further supplemental memoranda.

In addition, the staff received a copy of the presentation made at the August 15, 2024, Commission meeting by Lee Hepner on behalf of the American Economic Liberties Project.

California Life Sciences

This comment is from Sam Chung, Vice President of State Governmental Relations on behalf of California Life Sciences. According to its website:

> California Life Sciences (CLS) is the state's leading advocacy organization for the life sciences. CLS advances public policy that promotes innovation and improves access to transformative technologies. With offices in South San Francisco, San Diego, Sacramento, Los Angeles, and Washington DC, CLS has spent the past 30 years supporting organizations of all sizes, from early-stage innovators and startups to established leaders in the fields of biotechnology, pharmaceuticals, and medical technology. CLS' core mission is to advocate for a world class life sciences ecosystem in California, whose innovation leads to healthier lives around the world.

[1] Any California Law Revision Commission document referred to in this memorandum can be obtained from the Commission. Recent materials can be downloaded from the Commission's website (www.clrc.ca.gov). Other materials can be obtained by contacting the Commission's staff, through the website or otherwise.

The Commission welcomes written comments at any time during its study process. Any comments received will be a part of the public record and may be considered at a public meeting. However, comments that are received less than five business days prior to a Commission meeting may be presented without staff analysis.

California Nurses Association/National Nurses United

This comment is submitted by Carmen Comsti, Lead Regulatory Policy Specialist, on behalf of the California Nurses Association/National Nurses United. The comment includes studies related to labor and health care concentration.

Information Technology & Innovation Foundation

This submission is from Joseph V. Coniglio, Director of Antitrust and Innovation Policy, on behalf of the Information Technology & Innovation Foundation (ITIF). The submission is responsive to the August 15th Commission meeting addressing the reports on Concerted Action, Consumer Welfare Standard, and Enforcement and Exemptions.

According to its website,

> [ITIF] is an independent 501(c)(3) nonprofit, nonpartisan research and educational institute that has been recognized repeatedly as the world's leading think tank for science and technology policy. Its supporters include corporations, charitable foundations, and individual contributors….
>
> ITIF's mission is to formulate, evaluate, and promote policy solutions that accelerate innovation and boost productivity to spur growth, opportunity, and progress. ITIF's goal is to provide policymakers around the world with high-quality information, analysis, and actionable recommendations they can trust. To that end, ITIF adheres to a high standard of research integrity with an internal code of ethics grounded in analytical rigor, original thinking, policy pragmatism, and editorial independence.

Professor Tom Campbell

Professor Tom Campbell submitted his article "The Economics Case for the Consumer Welfare Standard in Antitrust,"[2] which was published in the American Bar Association's Antitrust Law Section's Antitrust Magazine. Tom Campbell is the Doy and Dee Henley Distinguished Professor of Jurisprudence and Professor of Economics, Chapman University, and an affiliated economist with Berkeley Research Group.

American Economic Liberties Project

As noted above, attached is the presentation given by Lee Hepner, Senior Counsel, on behalf of the American Economic Liberties Project at the Commission's August 15, 2024 meeting titled "Bringing Antitrust Theory into Practice." Additionally submitted is a

[2] Tom Campbell, *The Economics Case for the Consumer Welfare Standard in Antitrust*, Antitrust, Summer 2024, at 36.

memorandum in support of New York's Twenty-First Century Antitrust Act. According to the memorandum, "The American Economic Liberties Project is an organization dedicated to reducing the power that corporations wield over our economy and our democracy, in pursuit of economic liberty for all." More information about the American Economic Liberties Project can be found on their website.

Respectfully submitted,

Sharon Reilly
Executive Director

Sarah Huchel
Staff Counsel

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CALIFORNIA
LIFE SCIENCES

September 24, 2024

Hon. Chairperson David Huebner and Commissioners
California Law Review Commission (CLRC)
c/o Legislative Counsel Bureau
925 L Street, Suite 275
Sacramento, CA 95814

RE: Antitrust Law – Study B-750 – Comments from California Life Sciences

Dear Chairperson Huebner and Commissioners;

As representatives of the life sciences industry, directly employing over 400,000 Californians, California Life Sciences wishes to share our concerns regarding CLRC's recent proposed antitrust policies in their seven Study B-750 reports, and to **urge that CLRC not pursue antitrust policies that may compromise California's life sciences ecosystem**, which consistently delivers life-saving treatments for patients around the world. California Life Sciences represents over 1,200 entities representing pharmaceutical, biotechnology, medical technology, and academic research institutions throughout California. While we understand that rising consolidation across various sectors has raised concerns among policymakers, we believe that implementing a "one size fits all" approach to antitrust reform could dramatically and negatively impact life sciences companies investing in research and development in California and compromise our state's long-term biotechnology leadership. Furthermore, California's existing antitrust laws already allow regulatory actions to be brought against anticompetitive conduct. As such, California Life Sciences provides the following feedback on CLRC's Study B-750 reports relating to the application of the Cartwright Act to single life sciences firms, adoption of universal premerger notification requirements, restriction of resale price maintenance (RPM) for biopharmaceuticals, substitution of a "competitive process" standard for a "consumer welfare" standard, and ban on contractual arbitration agreements.

California's world-class life sciences ecosystem is dynamic and diverse, built on complex and symbiotic relationships between the academic researchers who often make

basic science discoveries, the federal institutions like the NIH who support this basic science research, the start-up companies that translate basic science discoveries into pharmaceutical innovations, the larger companies that help bring these innovations to market via drug development and clinical trials, and the network of venture capital that smooths the risks associated with this translation. Preserving the integrity of this symbiotic and multifaceted life sciences ecosystem is precisely why California Life Sciences wishes to detail several concerns with several aforementioned policy proposals from Study B-750.

First of all, CLRC proposes to significantly expand California's Cartwright Act to apply to behavior by single firms and to cover a wider range of collaborative agreements, which in our industry are critical to the development and commercialization of novel and life-saving treatments. As currently written, the Cartwright Act already outlaws any combinations or agreements which restrain trade or competition, or which fix or control prices. Expanding the Cartwright Act risks deterring collaborations within the dynamic life sciences ecosystem, in which larger companies routinely invest in smaller ones to bring their innovations to market. An expanded Cartwright Act that captures even procompetitive patent and licensing agreements under restraints of trade could seriously hamper biotechnology innovation in California and drive smaller firms into other states.

Furthermore, CLRC proposes a universal premerger notification requirement on any and all firms seeking to merge. As with expansions of the Cartwright Act, such a broad premerger notification regime would throw cold water on the dynamism of the life sciences research and innovation ecosystem. Companies with complementary technologies which could accelerate innovation if brought together under one roof would not only have to comply with the extensive US and global premerger notification requirements, but must now also file in California and any other future state that implements its own process, making it more costly and time-consuming to pursue beneficial collaborations. These acquisitions are vital to the life sciences, from basic academic collaborations with companies and other academics, to eventual licensing agreements between biotech firms. For the ecosystem to sustain itself, there must be a return on capital which bears the greatest risk given investment in nascent ideas, and a redeployment of those returns back into the system. Early-stage investors, who supply 53% of funding in this ecosystem, rely on acquisitions, IPOs, and/or other investors like venture firms or public equity investors to obtain that return. No bank, traditional financial institution, or government program can bear these sums of capital tied to high probabilities of failure. The innovation ecosystem has existed and evolved since the 1800s to allow for risk capital to finance risky endeavors. Large biopharmaceutical company acquisitions play a critical role in this ecosystem as they supply the remaining 47% of funding for small biotech firms. The also provide greater clinical and regulatory

speed, higher probability of success given institutional memory on decision making, and unequal reach to patients for the therapeutic candidates originating in small companies. Moreover, the American Hospital Association has critiqued such universal premerger notification paradigms as an arbitrary and de-facto "tax on mergers" which only serve to delay and deter innovation.

CLRC additionally proposes to either strictly scrutinize or outright ban RPM, despite the Supreme Court's *Leegin* opinion which permits RPM under the "rule of reason". While the applications of RPM are nuanced, broadly proscribing it could run afoul of established federal patent protections for biopharmaceuticals, whose prices are often a complex result of input research and development costs as well as federal provider reimbursement policies. A "one size fits all" RPM ban could prevent innovative new drugs and therapies from being brought to market to begin with, as companies would no longer be able to tolerate the risks and costs of bringing new therapies to market if they cannot be priced profitably.

CLRC also considers substituting a novel "competitive process" antitrust standard for the established "consumer welfare" standard used by antitrust enforcers for decades. Unlike the decades of legal and judicial precedent favoring the latter standard based on objective consumer prices, there is little recent historical precedent for subjective and ambiguous "competitive process" antitrust metrics. In fact, previous historical attempts to move beyond the "consumer welfare" standard often resulted in sporadic and arbitrary antitrust enforcement during the Brandeis Era. Life Sciences companies, like all companies, rely on the stability of consistent, objective, and established regulatory paradigms in order to operate effectively. Discarding the "consumer welfare" standard would inject considerable risk and uncertainty into the life sciences ecosystem, deterring innovation and costing patients access to new therapies as a result. This could also lead to baseless lawsuits against California companies from competitors seeking to exploit legal ambiguities and lack of judicial precedent; increasing costs for CA companies, reducing their investments in the state, and driving companies out of state.

Lastly, CLRC recommends banning certain contractual arbitration agreements that waive treble damages, attorney fees, and statutes of limitations. Prohibiting contractual arbitration agreements could drown life sciences companies in litigation costs and introduce considerable risk in both the recruitment and commercialization pipelines. In response, life sciences companies would likely be forced to reduce workforce development and bring fewer new drugs and therapies to market; instead having to incur the increased risks of litigation without arbitration agreements.

As our biotechnology companies continually evaluate worldwide investment decisions, California's antitrust regulatory ecosystem has previously encouraged them to invest in California because the state recognized the value of high-quality research and

the jobs and tax revenue that comes when that research turns into locally-manufactured products. This has kept California at the epicenter of the life sciences industry, birthing and sustaining thousands of companies, employing millions of Californians, and innovating countless products that save lives and revolutionize quality-of-life. The life sciences industry provides a unique return on investment with respect to research and development. Nationwide, life sciences companies have collectively invested more than $1 trillion dollars in R&D since 2000, establishing the biopharmaceutical sector as the most R&D-intensive industry in the U.S. economy. In fact, the biopharmaceutical industry invests approximately six times more in R&D as a percentage of sales than all other manufacturing industries. However, the new antitrust proposals from Study B-750 would upend that paradigm, saddling California life sciences companies with increased risks and costs that would force more of them to seek more stable regulatory environments out of state.

We respectfully urge the CLRC to consider California's robust and dynamic life sciences ecosystem when discussing antitrust legislative proposals, and we remain eager to engage with the CLRC on antitrust policy moving forward. If you have any additional questions, please feel free to contact me at schung@califesciences.org.

Sincerely,

Sam Chung
Vice President, State Government Relations
California Life Sciences

California Nurses Association
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OUR PATIENTS. OUR UNION. OUR VOICE.

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September 9, 2024

The Honorable Ambassador David Huebner, Chair
California Law Revision Commission
c/o Legislative Counsel Bureau
925 L Street, Suite 275
Sacramento, CA 95814

RE: Supplemental Comments on Antitrust Law - Study B-750, Mergers and Acquisitions

Dear Chair Huebner,

California Nurses Association/National Nurses United (CNA), representing more than 100,000 registered nurses (RNs) throughout California who provide direct patient care in hospital and other health care settings, writes to provide supplemental material to our comments from July 19, 2024, to the California Law Revision Commission regarding Antitrust Law – Study B-750.

Please find attached below studies related to market consolidation in the health care sector and to labor market consolidation.

CNA again appreciates the opportunity to provide comments and feedback on this study.

Respectfully,

Carmen Comsti
Lead Regulatory Policy Specialist
California Nurses Association/National Nurses United

Cc: Sharon Reilly, Executive Director, California Law Revision Commission
Cheryl Johnson, Consultant to the California Law Revision Commission

List of Attachments

1. Arnold D, King J, Fulton B, Montague A, Gudiksen K, Greaney T, and Scheffler R (Apr. 2024), "New evidence on the impacts of cross-market hospital mergers on commercial prices and measures of quality," *Health Services Research* (Apr. 2024), doi: 10.1111/1475-6773.14291, https://pubmed.ncbi.nlm.nih.gov/38652542/.

2. Arnold D (Oct. 2021), "Mergers and Acquisitions, Local Labor Market Concentration, and Worker Outcomes," Mimeo, https://darnold199.github.io/madraft.pdf.

3. Fulton B, Arnold D, King J, Montague A, Greaney T, and Scheffler R (Nov. 2022), "The Rise of Cross-Market Hospital Systems and Their Market Power in the US," *Health Affairs*, 41(11): 1652-60, https://www.healthaffairs.org/doi/10.1377/hlthaff.2022.00337.

4. Hafiz H and Marinescu I (2023), "Labor Market Regulation and Worker Power," *University of Chicago Law Review*, Vol. 90(2): 469-509, https://chicagounbound.uchicago.edu/uclrev/vol90/iss2/6/.

5. Scheffler R, Arnold D, and Whaley C (2018), "Consolidation Trends In California's Health Care System: Impacts on ACA Premiums and Outpatient Visit Prices," *Health Affairs*, 37(9): 1409-16, https://www.healthaffairs.org/doi/full/10.1377/hlthaff.2018.0472.

ATTACHMENT #1

California Nurses Association, Supplemental Comments

to the California Law Revision Commission

Antitrust Law - Study B-750, Mergers and Acquisitions

Arnold D, King J, Fulton B, Montague A, Gudiksen K, Greaney T, and Scheffler R (Apr. 2024), "New evidence on the impacts of cross-market hospital mergers on commercial prices and measures of quality," *Health Services Research* (Apr. 2024), doi: 10.1111/1475-6773.14291, https://pubmed.ncbi.nlm.nih.gov/38652542/.

DOI: 10.1111/1475-6773.14291

RESEARCH ARTICLE

HSR Health Services Research

New evidence on the impacts of cross-market hospital mergers on commercial prices and measures of quality

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Abstract

Objective: To examine the impact of "cross-market" hospital mergers on prices and quality and the extent to which serial acquisitions contribute to any measured effects.

Data Sources: 2009–2017 commercial claims from the Health Care Cost Institute (HCCI) and quality measures from Hospital Compare.

Study Design: Event study models in which the treated group consisted of hospitals that acquired hospitals further than 50 miles, and the control group was hospitals that were not part of any merger activity (as a target or acquirer) during the study period.

Data Extraction Methods: We extracted data for 214 treated hospitals and 955 control hospitals.

Principal Findings: Six years after acquisition, cross-market hospital mergers had increased acquirer prices by 12.9% (CI: 0.6%–26.6%) relative to control hospitals, but had no discernible impact on mortality and readmission rates for heart failure, heart attacks and pneumonia.

For serial acquirers, the price effect increased to 16.3% (CI: 4.8%–29.1%). For all acquisitions, the price effect was 21.8% (CI: 4.6%–41.7%) when the target's market share was greater than the acquirer's market share versus 9.7% (CI: 0.5% to 20.9%) when the opposite was true. The magnitude of the price effect was similar for out-of-state and in-state cross-market mergers.

Conclusions: Additional evidence on the price and quality effects of cross-market mergers is needed at a time when over half of recent hospital mergers have been cross-market. To date, no hospital mergers have been challenged by the Federal Trade Commission on cross-market grounds. Our study is the third to find a positive price effect associated with cross-market mergers and the first to show no quality

effect and how serial acquisitions contribute to the price effect. More research is needed to identify the mechanism behind the price effects we observe and analyze price effect heterogeneity.

KEYWORDS
cross-market, health care competition, hospitals, price, quality, serial acquisitions

What is known on this topic

- Over half of the hospital mergers in the last decade have been cross-market.
- Cross-market hospital mergers lead to higher hospital prices.

What this study adds

- Serial acquirers are significant contributors to estimated cross-market price effects.
- We find no discernible impact of cross-market mergers on mortality and readmission rates for heart failure, heart attacks and pneumonia.
- Overall, this study provides further evidence that cross-market hospital mergers lead to price increases and novel findings of no quality effect and the impact of serial acquirers on the price effect. More antitrust scrutiny of these mergers—particularly those of serial acquirers—appears prudent given the current state of highly concentrated hospital markets in the United States.

1 | INTRODUCTION

U.S. hospitals have been consolidating for decades. Between 1998 and 2017 there were 1577 hospital mergers with 456 occurring from 2013 to 2017.[1] By 2016, 90% of Metropolitan Statistical Areas (MSAs) were highly concentrated according to the U.S. Department of Justice (DOJ) and Federal Trade Commission (FTC)'s Horizontal Merger Guidelines.[2] Hospitals joining systems is a primary driver of this increase in concentration. From 1970 to 2019, the percentage of hospitals in multi-hospital systems increased substantially from 10% to 67%.[3]

As hospital systems have expanded, they've extended into regions where they previously had no presence.[4] A recent study found 55% of the 1500 hospitals targeted for a merger or acquisition from 2009 to 2019 operated in a commuting zone that the acquirer did not previously operate in.[3] The price and quality effects of these "cross-market" hospital mergers and acquisitions (M&A) are the focus of this paper.

Two previous empirical studies examine the price impacts of cross-market hospital mergers – Lewis and Plum (2017) and Dafny, Ho, and Lee (2019).[5,6] Lewis and Pflum (2017) found that prices at target hospitals involved in cross-market mergers increased by about 17% more than unacquired, stand-alone hospitals, with these increases reaching 29% for targets acquired by large systems and 33% for small targets being acquired. The authors additionally showed that out-of-market mergers lead to a relaxation of competition; that is, the prices of nearby competitors to acquired hospitals increase by around 8%.[5]

Dafny, Ho, and Lee (2019) found that hospitals involved in cross-market mergers had price increases of 7% to 10% relative to control hospitals if the acquisition was in-state, but did not find relative price increases when the acquisition was out-of-state. The price effect persisted when the target hospitals were excluded from the model, meaning the acquiring system's hospitals also had relative price increases. The price increase of the acquiring system's hospitals climbed to 31% when the acquirer had a below-median market share and the target had an above-median market share, and the price increase was 18% in the opposite situation, when the acquirer had an above-median market share and the target had a below-median market share.[6]

The contribution of our paper is threefold. First, we add to the empirical evidence of the price effects of cross-market hospital mergers by providing the first evidence using the actual prices paid by commercial insurers (and consumers through out-of-pocket payments). The two previous empirical papers on the price effects of cross-market mergers calculated prices by adjusting revenue data collected at the hospital level. Second, we provide the first evidence of the quality effects of cross-market mergers. Compared with the empirical evidence on the price and quality effects of horizontal hospital mergers, the empirical evidence on the effects of cross-market hospital mergers is sparse.

Finally, we are the first to present evidence of the price effects generated by serial cross-market acquirers. We do this by utilizing a new difference-in-differences estimator that allows treated units to receive multiple changes in their treatment dose by redefining the "event" as the first time a group's treatment changes.[7] Accounting for increases in treatment dose is particularly important in our setting as it was very common for the acquiring systems in our sample to acquire a cross-market hospital in more than 1 year during our study period. Importantly, this allows our work to complement Dafny, Ho,

and Lee (2019), which limited its treatment sample to hospitals experiencing a treatment only once during the five-year period spanning the transaction generating that treatment. The authors noted that this means the transactions included in their final analysis sample "involve smaller acquirers (as measured by the number of facilities), as larger acquirers tend to engage in multiple closely timed acquisitions."[6] The new estimator allows us to estimate the impact of cross-market mergers on the prices of hospitals that are part of the large systems that serially acquire cross-market hospitals.[7]

We focus on the cross-market price effect at acquiring hospitals as opposed to target hospitals. Lewis and Pflum (2017) convincingly show that cross-market mergers lead to higher prices at target hospitals.[5] But from an antitrust perspective, challenging cross-market mergers is less of an uphill battle if the evidence is clear that cross-market mergers allow acquirers to increase their prices, because prices at the acquirer are not likely to increase due to a "change in control" or better quality. Change in control theory in the context of cross-market mergers boils down to the acquirer being able to increase prices at the target because the target wasn't maximizing profit; either because it was nonprofit and maximizing profit wasn't its objective, or because it didn't have the bargaining skill to negotiate high prices.[8] Acquirers by definition do not experience a change of control and thus this explanation for higher prices after a cross-market merger is ruled out. It also seems unlikely that an increase in quality could explain acquirer price increases after a cross-market merger. Acquirers are often large health systems whereas targets are frequently independent hospitals.[3] It seems unlikely that a large health system's quality would improve by merging with an independent hospital. However, despite acquirer quality improvements being a priori unlikely, we test this empirically to confirm our intuition.

1.1 | Potential mechanisms

To date economists have proposed five mechanisms for cross-market price increases: (1) common customers, (2) tying, (3) change in control, (4) hospital quality improvements, and (5) multimarket contact. As noted in the previous paragraph, our focus on acquirer prices is meant to make it unlikely that (3) and (4) are the mechanisms driving our result. We discuss (1), (2), and (5) briefly for the remainder of this section (see King et al. 2023 for a more detailed review of these mechanisms).[8]

The common customer theory states that cross-market price increases can arise from the market linkages created by the existence of a common customer. The common customer could be an employer or insurer. Employers (or the insurers who sell to them) need provider networks that span multiple patient markets if they have employees in multiple markets. For instance, a large national employer like Wal-Mart needs a health plan that has provider networks in all parts of the country. Wal-Mart could contract with a different local health plan in all parts of the U.S., but it's easy to see how contracting with one insurer that has created a provider network that covers the whole country could be desirable.

Tying deals with how a firm with market power in one market (the tying market) can tie its sales in that market with its sales in a second market (the tied market). Tying by a monopolist can reduce the sales of its competitors in the tied market and lower their profits below a level that would justify continuing operations.[9] Bundling across markets can also increase the bargaining strength of firms and lead to higher prices without disadvantaging rivals.[10,11]

Multimarket contact is the notion that as hospital systems grow they will increasingly come into contact with each other in more and more markets throughout the U.S. Bernheim and Whinston[12] show how multimarket contact can lead to collusive behavior. For example, if systems A and B know they are going to compete against each other several times for inclusion in insurers' networks, it may make sense for them to not compete as much on price as they would have in a one-off situation for fear of retaliation.[13,14]

2 | DATA

2.1 | Hospital prices

We utilized 2009–2017 commercial claims from the Health Care Cost Institute (HCCI)'s 1.0 database to construct our measure of hospital price. HCCI 1.0 pools medical claims data from three large U.S. health insurers—Aetna, Humana, and UnitedHealth. The HCCI data covers on average 45 million under age 65 individuals with commercial insurance per year from 2009 to 2017 and includes observations from every U.S. state and metropolitan statistical area. Our price measure is the amount paid to a hospital for a standardized inpatient admission. The amount paid is the amount paid by the health insurer plus the out-of-pocket amount paid by the patient, including deductibles, copayments, and coinsurance. We standardized prices by dividing the total amount paid for admissions to a hospital by the number of standardized admissions. A standardized admission is an admission of average intensity, with a relative weight equal to one, but admissions that deviate from the average intensity receive a relative weight that reflects their intensity. We used MS-DRG relative weights, which assign relative weights based on the clinical characteristics of the inpatient stay and the expected resource requirements. For example, a kidney transplant is more complicated and requires more clinical resources than an uncomplicated childbirth. In 2017, a kidney transplant had a relative weight of 3.2, and, therefore, accounted for 3.2 standardized admissions, whereas an uncomplicated childbirth, which had a relative weight of 0.6, accounted for 0.6 standardized admissions. This data has been used in several studies that have analyzed the impact of health care consolidation on prices, but has never been used in the context of cross-market hospital mergers.[15–17]

2.2 | Hospital quality

Our measures of hospital quality were extracted from CMS' Hospital Compare. We extracted six measures of quality for which data was

consistently reported during from 2009 to 2017: 30-day mortality and readmissions rates for heart failure, heart attacks, and pneumonia. All six measures can range from 0 to 100 with lower values indicating better quality. This data has been used in several studies to analyze the impact of hospital consolidation on quality.[16,18]

2.3 | Cross-market hospital mergers

We began by constructing a panel of the short-term community hospitals using Fiscal Years 2009–2017 of the American Hospital Association (AHA)'s Annual Survey. We then used hospital ownership information from AHA to determine whether a hospital was involved in M&A activity during a given year. We identified hospitals that were M&A targets as those whose system identifiers changed between years in the AHA data. We identified acquirers as hospitals in systems containing hospital targets, but whose system identifiers did not change. In the case when a merger led to all hospitals in the merged system obtaining a new system identifier, we categorized the hospitals in the system that had more hospitals pre-merger as acquirer hospitals and the hospitals in the system with fewer hospitals pre-merger as target hospitals.

2.4 | Control variables

We included a set of time-varying hospital- and county-level control variables in our models. The hospital-level control variables were extracted from AHA and included a hospital's number of beds, indicator variables for the hospital's for-profit, government, or teaching hospital status, and the hospital's share of inpatient days from Medicare and Medicaid enrollees (to control for potential cost-shifting) as well as its number of technologies. The county-level control variables included number of hospitals, uninsured rate, median household income, population, and unemployment rate.

3 | EMPIRICAL STRATEGY

We used the event study estimator developed by de Chaisemartin and D'Haultfoeuille (Forthcoming) (hereafter, dCDH estimator) to quantify the impact of cross-market hospital mergers on the price and quality of acquiring hospitals.[7] To the best of our knowledge, the dCDH estimator is the first estimator that both (1) incorporates the recent developments in the difference-in-differences event study literature[19] (e.g., accounting for staggered interventions with heterogeneous treatment effects) and (2) enables an estimate of multiple treatments, which is critical for our serial acquisition analysis. The estimator allows treated units to receive multiple changes in their treatment dose by redefining the "event" as the first time a group's treatment changes. Accounting for increases in treatment dose is particularly important in our setting as it was very common for the acquiring systems in our sample to acquire a cross-market hospital in more than 1 year between 2011 and 2017. Of the 214 acquiring hospitals that met our treatment requirements, only 32 of them acquired a cross-market hospital in only 1 year from 2011 to 2017. Among the remaining 182 treated hospitals, 96 hospitals were part of systems that acquired a cross-market hospital in four or more years from 2011 to 2017. These 96 hospitals were spread across 12 systems (see Table A1 in the appendix for the full distribution).

Before presenting the regression model we estimated, we first detail how we constructed our sample of treated and control hospitals. Treated hospitals met the following criteria: (1) they, independently or as part of a system, acquired a hospital (or system) that was further than 50 miles away between 2011 and 2017, with the first acquisition occurring from 2011 to 2015; and (2) they were never a target of an acquisition from 2009 to 2017. The 50-mile requirement was to ensure that the mergers were safely "cross-market." While treated hospitals needed to be more than 50 miles from any target hospital, it could be the case that other hospitals in the acquiring system were within 50 miles. For instance, if a two-hospital system (hospitals A1 and A2) acquired independent hospital B, and A1 was 100 miles from B and A2 was 25 miles from B, we would consider just A1 to be treated. Other studies use similar distance cutoffs for defining cross-market. Lewis and Pflum (2017) used 45 miles and Dafny, Ho, and Lee (2019) used 30 min' drive.

The requirement that the first acquisition needed to occur during 2011–2015 means the treated hospitals did not participate in a merger or acquisition transaction for at least 2 years prior to treatment, providing a "clean" pre-treatment period to assess relative difference-in-differences in prices between the treatment and control hospitals prior to the treated period. This requirement also ensures at least 3 years of price data post-acquisition (including the acquisition year) was available for treated hospitals. Hospitals that were not involved in M&A (either as targets or acquirers) from 2009 to 2017 served as our control hospitals.

The idea behind the dCDH estimator is to take the perspective of a social planner seeking to conduct a cost–benefit analysis comparing hospitals' actual treatments (i.e., acquiring a cross-market hospital) to the counterfactual "status-quo" scenario where every hospital would have kept the same treatment as in period 1 (i.e., no cross-market acquisitions). In our context, the planner wants to know if the cross-market mergers that took place over the entire duration of the study period led prices and quality to be higher or lower. This means we can account for a common scenario in our data of a treated hospital receiving multiple "doses" in the form of acquiring multiple cross-market hospitals over our study period. For instance, if a hospital acquired a cross-market hospital in 2011, 2015, and 2017 we would consider it to have been treated three times. See Appendix A for the technical details and identifying assumptions of the dCDH estimator in our context.

4 | RESULTS

Table 1 shows descriptive statistics for the 214 treated hospitals and 955 control hospitals in our sample. Treated hospitals were more

TABLE 1 Attributes of treated and control hospitals.

	Treated hospitals mean (SD)	Control hospitals mean (SD)	*p*-Value differences in means
Dependent price variable			
ln(Price)	9.35 (0.46)	9.17 (0.54)	<0.01
Price ($)	12,661 (5552)	11,079 (6344)	<0.01
Hospital characteristics			
Beds	187 (192)	206 (216)	<0.01
For-Profit	0.21 (0.41)	0.02 (0.15)	<0.01
Government	0.06 (0.23)	0.34 (0.47)	<0.01
Teaching	0.05 (0.22)	0.09 (0.29)	<0.01
Medicare Share of IP Days	0.53 (0.14)	0.50 (0.17)	<0.01
Medicaid Share of IP Days	0.19 (0.11)	0.21 (0.15)	<0.01
Technologies	50 (31)	49 (33)	0.65
County characteristics			
Population	486,317 (1,303,104)	713,857 (1,637,878)	<0.01
Median Income ($)	49,863 (12,301)	51,986 (13,923)	<0.01
Uninsured	0.15 (0.06)	0.15 (0.06)	0.02
Unemployed	0.07 (0.03)	0.07 (0.03)	0.13
Rural	0.31 (0.26)	0.31 (0.28)	0.85
Hospitals	4.3 (9.2)	5.8 (11.9)	<0.01
Census region			
Northeast	0.06 (0.23)	0.15 (0.36)	<0.01
Midwest	0.24 (0.43)	0.26 (0.44)	
South	0.41 (0.49)	0.35 (0.48)	
West	0.29 (0.46)	0.24 (0.43)	
Observations	1926	8595	
Unique Hospitals	214	955	

Note: Statistics in the table are pooled across years. Treatment hospitals included hospitals (or hospitals within systems) that met the following criteria: (1) hospitals that made an acquisition from 2009 to 2017 of a hospital (or system) that was further than 50 miles away, with the first acquisition occurring from 2011 to 2015; and (2) hospitals that were never a target of an acquisition from 2009 to 2017. Control hospitals were never part of merger activity (either as a target or acquirer) from 2009 to 2017.
Abbreviations: IP, inpatient; ln, natural log; SD, standard deviation.

likely to be for-profit and have a higher share of Medicare inpatient days than control hospitals. They also had fewer beds, a lower share of Medicaid inpatient days, and were less likely to be government or teaching hospitals than control hospitals. In terms of county characteristics, treated hospitals were in counties with a lower population, lower income, and fewer hospitals than control hospitals. They were also more likely to be in the South and West Census Regions than control hospitals.

Figure A1 in the appendix shows the raw price trends for treated and control hospitals. As a reminder, our group of treated hospitals was constructed so that they were first treated during the 2011–2015 time period. The breakdown by treatment year for the 214 treated hospitals in our sample is 80 in 2011, 31 in 2012, 49 in 2013, 37 in 2014, and 17 in 2015. The average price at treated hospitals started higher than that of control hospitals and remained higher throughout our 2009–2017 study period. The average price for treated hospitals grew by 40% over the period (from $10,479 in 2009 to $14,640 in 2017) whereas the average price for control hospitals grew by 39% over the period (from $9184 in 2009 to $12,758 in 2017).

Figure A2 in the appendix splits the treated group of hospitals by whether the hospital was part of a system that acquired cross-market hospitals in four or more years from 2011 to 2017. The control hospital price trend lines in Figure A2 are the same as the control price line shown in Figure A1. Panel A shows the average price of the 118 treated hospitals whose systems acquired cross-market hospitals in three or fewer years from 2011 to 2017 grew by 33% (from $11,299 to $15,059). Panel B shows the average price of the 96 treated hospitals whose systems acquired cross-market hospitals in four or more years from 2011 to 2017 grew by 49% (from $9471 to $14,125).

Figure 1 graphically depicts the results of our regression analysis (see Table A2 in the appendix for the regression coefficients underlying the figure). The placebo estimates $(t = -4 \ldots 2)$ all hover around zero and are not statistically significant. The DID_t estimates start out

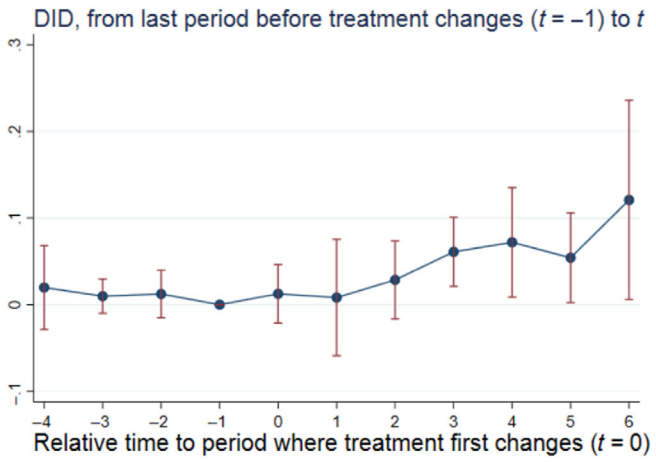

FIGURE 1 Effect of cross-market M&A on acquirers' prices. Standard errors were estimated using 100 bootstrap replications clustered at the hospital level. The regression underlying this figure included hospital and year fixed effects as well as time-varying hospital- and county-level control variables. The hospital-level control variables included number of beds, indicator variables for the hospital's for-profit, government, or teaching hospital status, and the hospital's share of inpatient days from Medicare and Medicaid enrollees as well as its number of technologies. The county-level control variables included number of hospitals, uninsured rate, median household income, population, and unemployment rate. The coefficient estimates corresponding to this figure are available in Table A2 of the appendix. DID, difference-in-differences; M&A, mergers and acquisitions; *t*, time since treatment first changes.

around zero and begin trending up at $t = 2$. By $t = 3$ the coefficient estimate is 0.061 and is statistically significant ($p = 0.003$). By $t = 6$ the coefficient estimate is 0.121 ($p = 0.039$) indicating that prices at hospitals treated for the first time six periods ago are 12.9% (=(exp (0.121)-1)*100) higher relative to prices at control hospitals.

In Figure 2 we attempt to disentangle the 12.9% price effect. Panel A shows the event study where we keep the control hospitals the same, but the treated group is now the 118 treated hospitals whose systems acquired cross-market hospitals in three or fewer years from 2011 to 2017. Panel B shows the event study where the control hospitals are the same, but the treated group is the 96 treated hospitals whose systems acquired cross-market hospitals in four or more years from 2011 to 2017. Panel A again shows no sign of a pre-trend and the $t = 4$ coefficient of 0.069 is statistically significant ($p = 0.065$), indicating there is still a price effect when the cross-market acquisition isn't part of an extended string of cross-market acquisitions in successive years. However, the price effect appears more transitory in this case as the coefficient estimates are directionally negative and not statistically significant in $t = 5,6$.

Panel B, on the other hand, shows a steady and persistent price effect. The $t = 4$ coefficient is 0.075 ($p = 0.096$), and by the time $t = 6$ comes around the coefficient is 0.151 ($p = 0.004$), indicating prices are 16.3% (CI: 4.8%–29.1%) higher at treated hospitals that are part of systems serially acquiring cross-market hospitals relative to prices at control hospitals.

In Figure 3 we show how the price effect differs by whether the acquiring hospital had a higher or lower market share than the target system. Each hospital's market share was measured as its share of admissions among general acute care hospitals located in its county. Next, we compared each treated hospital's market share to the market share of the target it was acquiring. If the target was more than one hospital we calculated the target's market share as the weighted average (using admissions) of the county market shares of its system members. Panel A includes treated hospitals whose market shares were below the market shares of the first cross-market targets they acquired during the study period. Panel B shows the opposite situation – it includes treated hospitals whose market shares were above the market shares of the first cross-market targets they acquired during the study period. The average market shares of the targets and acquirers in Panel A were 76% and 56%, respectively. The average market shares of the targets and acquirers in Panel B were 24% and 59%, respectively. Comparing the two event studies plots indicates that the price effect is twice as large when the target's market share is greater than the acquirer's (the $t = 6$ coefficient is a positive and statistically significant 0.197 ($p = 0.011$) indicating prices 21.8% (CI: 4.6%–41.7%) higher than those at control hospitals, see Panel A) than it is in the reverse situation (the $t = 6$ coefficient is a positive and statistically significant 0.092 ($p = 0.063$) indicating prices 9.7% (CI: 0.5% to 20.9%) higher than those at control hospitals, see Panel B).

Figure A3 in the appendix delves deeper into the acquirer price effect of cross-market mergers by assessing whether there is a difference between the price effect of cross-market mergers that occur within a state and those that cross-state lines. Among the 214 treated hospitals in our sample, 68 hospitals only experienced out-of-state cross-market mergers during our study period. Our sample also included 60 hospitals that only experienced within state cross-market mergers during our study period. The remaining 86 treated hospitals experienced some combination of out-of-state and within state cross-market mergers during our study period.

Panel A in Figure A3 shows the event study after removing all treated hospitals in the sample except the 68 hospitals that only experienced out-of-state cross-market mergers during our study period. The figure is very similar to that shown for the full sample, indicating that the price effect for out-of-state cross-market mergers is no different to than it is for other types of cross-market mergers. Specifically, the $t = 6$ coefficient is identical magnitude to that of the $t = 6$ coefficient in full sample version (0.121 and 0.121), so they are not statistically different. Panel B repeats the analysis using the 60 hospitals that only experienced in-state cross-market mergers as the treated hospitals. It's $t = 6$ coefficient (0.130) is not statistically different than the $t = 6$ coefficients in the full sample and Panel A.

Figure 4 shows the quality effect of cross-market hospital mergers. Panel A shows the event studies when heart failure mortality and heart failure readmission rate are the dependent variables. In both cases there is no noticeable pre-trend and none of the post-treatment coefficients are statistically different from

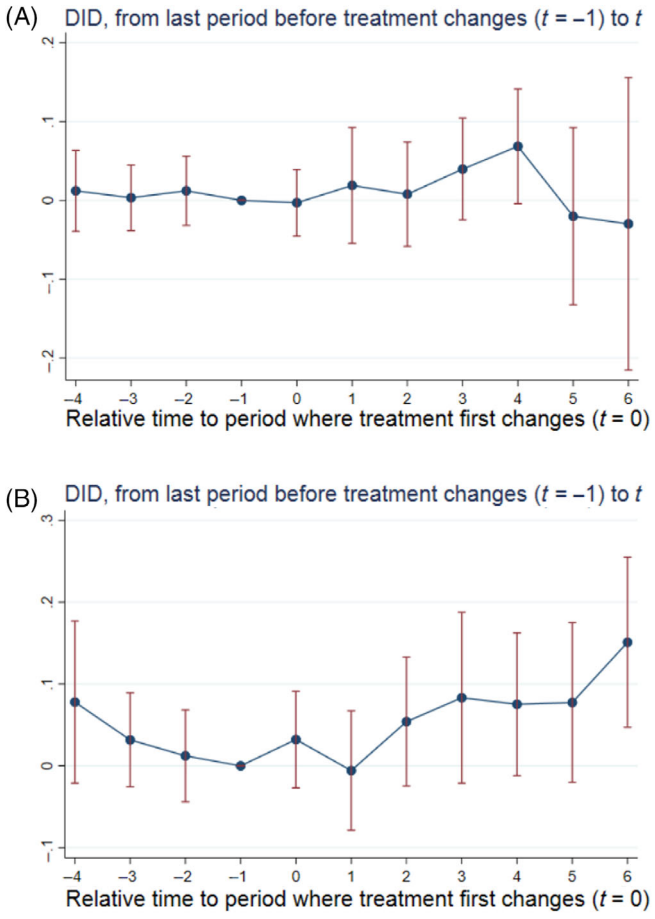

FIGURE 2 Effect of cross-market M&A on acquirers' prices by number of years as a cross-market acquirer. (A) Acquirers in 3 or fewer years. (B) Acquirers in 4 or more years. Standard errors were estimated using 100 bootstrap replications clustered at the hospital level. Panel A includes the 118 treated hospitals that were part of systems that acquired hospitals more than 50 miles away in three or fewer separate years between 2011 and 2017. Panel A includes the 96 treated hospitals that were part of systems that acquired hospitals more than 50 miles away in four or more separate years between 2011 and 2017. The regressions underlying these event study plots included hospital and year fixed effects as well as time-varying hospital- and county-level control variables. The hospital-level control variables included number of beds, indicator variables for the hospital's for-profit, government, or teaching hospital status, and the hospital's share of inpatient days from Medicare and Medicaid enrollees as well as its number of technologies. The county-level control variables included number of hospitals, uninsured rate, median household income, population, and unemployment rate. DID, difference-in-differences; M&A, mergers and acquisitions; *t*, time since treatment first changes.

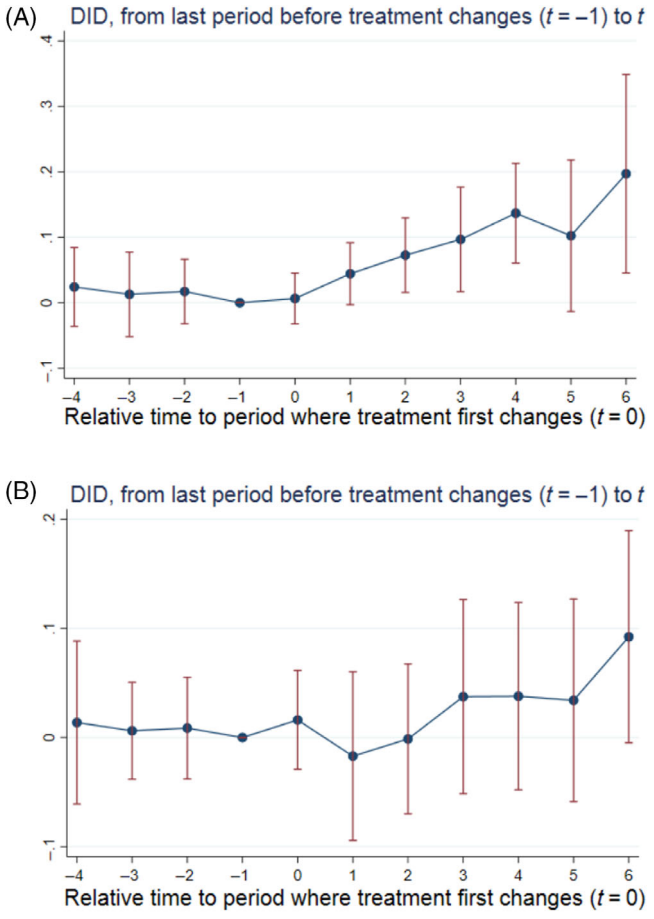

FIGURE 3 Effect of cross-market M&A on acquirers' prices by whether the target or acquiring hospital had greater market share. (A) Target Market Share > Acquirer Market Share. (B) Acquirer Market Share > Target Market Share. Standard errors were estimated using 100 bootstrap replications clustered at the hospital level. Panel A includes the 87 treated hospitals whose market shares were lower than those of the first cross-market targets they acquired during the study period. Panel B includes the 127 treated hospitals whose market shares were higher than those of the first cross-market targets they acquired during the study period. The regressions underlying these event study plots included hospital and year fixed effects as well as time-varying hospital- and county-level control variables. The hospital-level control variables included number of beds, indicator variables for the hospital's for-profit, government, or teaching hospital status, and the hospital's share of inpatient days from Medicare and Medicaid enrollees as well as its number of technologies. The county-level control variables included number of hospitals, uninsured rate, median household income, population, and unemployment rate. DID, difference-in-differences; M&A, mergers and acquisitions; *t*, time since treatment first changes.

zero. Panel B likewise shows minimal to no impact of cross-market mergers on acquirer quality when heart attack mortality and readmission rate are the dependent variables. None of the post-treatment coefficients are statistically different from zero for heart attack mortality. For the heart attack readmission rate event study, the $t = 6$ coefficient is positive and statistically significant ($0.494; p = 0.039$) which suggests cross-market mergers reduce acquirer quality by increasing the heart attack readmission rate, however, there was a pre-treatment trend in this case so this result is ambiguous. Panel C shows the event studies for pneumonia mortality and readmission rate. Just as in Panel A, both plots show the post-treatment coefficients all being close to zero and not statistically significant. Overall, our results point to cross-market mergers having no impact on acquirer quality.

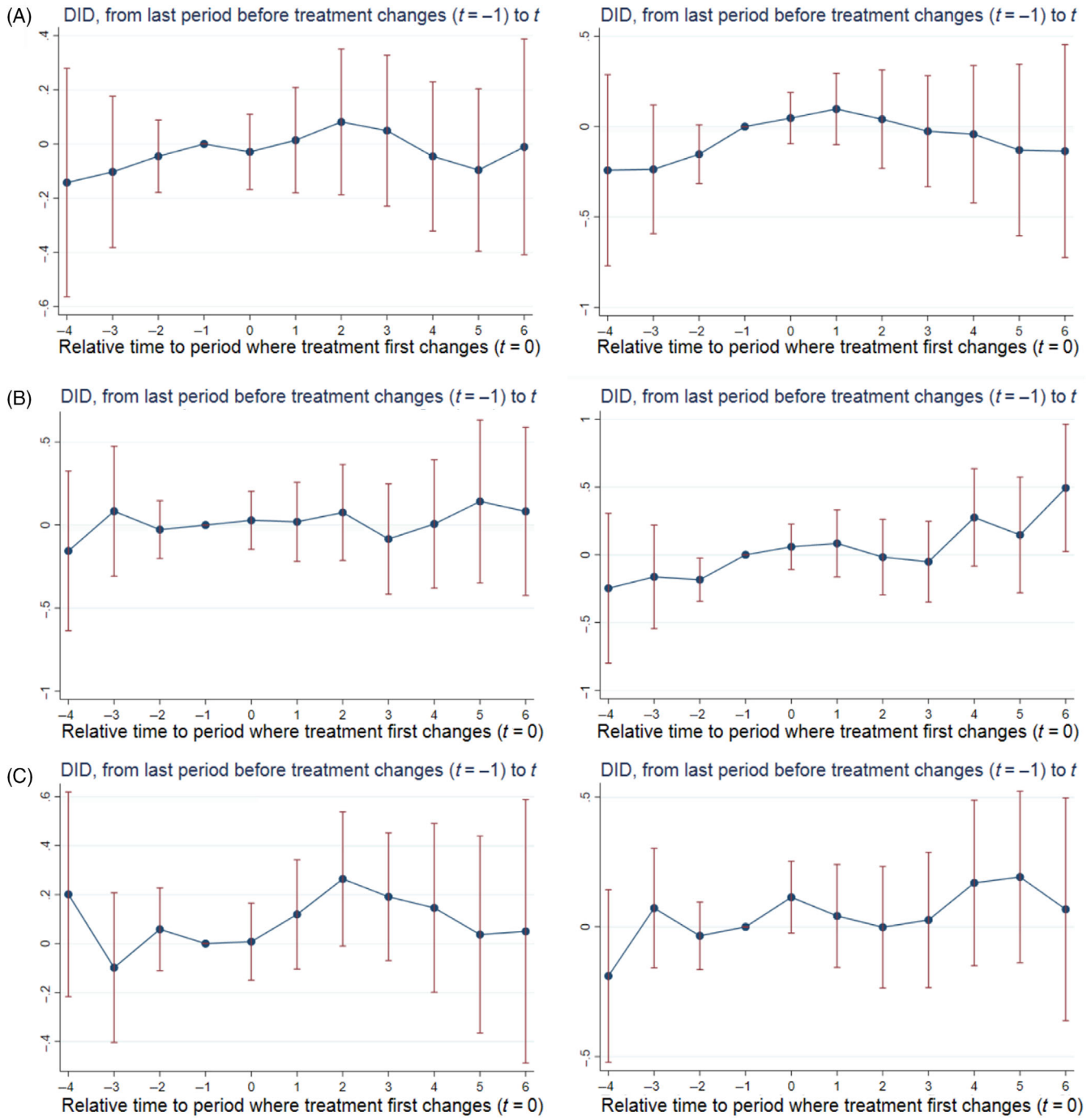

FIGURE 4 Effect of cross-market M&A on acquirers' quality. (A) Heart Failure. (B) Heart Attack. (C) Pneumonia. Standard errors were estimated using 100 bootstrap replications clustered at the hospital level. The regressions underlying these event study plots included hospital and year fixed effects as well as time-varying hospital- and county-level control variables. The hospital-level control variables included number of beds, indicator variables for the hospital's for-profit, government, or teaching hospital status, and the hospital's share of inpatient days from Medicare and Medicaid enrollees as well as its number of technologies. The county-level control variables included number of hospitals, uninsured rate, median household income, population, and unemployment rate. DID, difference-in-differences; M&A, mergers and acquisitions; *t*, time since treatment first changes.

5 | DISCUSSION

This article contributes to the small, but growing, literature that analyzes cross-market hospital mergers and acquisitions and examines whether they can lead to price increases and harm competition.[5,6] Similar to those studies, we find that cross-market hospital acquisitions are associated with acquirer price increases of 12.9% as compared with controls, 6 years following the merger or acquisition. Our

results suggest there is a time delay of a few years following successful completion of the merger before price effects emerge, which may be due to existing contracts with insurers or a desire to not immediately increase prices for other reasons.

In addition, we found larger price effects when the acquirer had lower market share than the target, although significant price increases were still found when the opposite was true. This finding makes intuitive sense, as acquirers with lower market share have more to gain from acquiring an entity with market power. We also found that the price effects following cross-market acquisitions existed for both within-state transactions and out-of-state transactions, but price effects of within-state transactions emerged earlier post-transaction. In contrast to Dafny et al.[6] our findings suggest that cross-market price effects extend across state lines, consistent with the theory that when common customers, such as the big 5 national insurers,[20] negotiate with multi-hospital systems that cross state lines, they can be subject to their market power.

In addition to being the first study to use healthcare claims data to find that cross-market acquisitions result in price increases, our novel contribution to the literature is that we have disentangled some of the price effects to provide guidance on the characteristics of acquiring hospital systems and cross-market mergers that are likely to have the greatest price effects over time. Our analysis of health systems that engaged in 4 or more cross-market acquisitions between 2011 and 2017 (approximately 45% of treated hospitals) revealed that those serial cross-market acquirers had 16.3% higher prices than controls 6 years after the acquisition. In contrast, health systems that acquired three or fewer cross-market entities during the study period showed some signs of price effects at year 4 but they proved transitory over time. We also analyzed the impact of cross-market hospital acquisitions on six quality measures and found no significant quality effects, suggesting that the price effects do not arise from post-transaction improvements in quality of care.

Our study has several limitations. First, the claims we used to calculate prices came from only three insurers – UnitedHealth, Aetna, and Humana. While these three insurers are large, national players, they account for only about a third of employer-sponsored health insurance enrollment in the United States. We expect the prices these three insurers receive to be correlated with those of other insurers, but to the extent that they are not, our price results could be biased (in either direction). It seems unlikely that quality would differ by insurer within the same hospital, but there could also be some bias in our quality estimates if the in-network hospitals for these three insurers differed from the in-network hospitals of other insurers. Second, we do not answer the distance gradient question of how the price effect changes as the distance between cross-market hospital targets and acquirers grows. We use a 50-mile threshold to define cross-market, but we are not able to comment on whether a 100-mile cross-market transaction has a larger price effect than a 300-mile cross-market transaction. Third, by reducing to a single hospital price we cannot provide detail on how changes in prices may vary heterogeneously for each specific DRG or service line. Fourth, we are unable to pinpoint a primary cross-market mechanism that is at work here. By focusing on acquirers' prices, we think it is unlikely that change-in-control or quality improvements explain the observed price increases, but whether tying, common customers, or multimarket contact is largely responsible remains unclear. These limitations are important for policymakers and antitrust regulators to consider in light of our findings. Future research that identifies the mechanism (or degree to which multiple mechanisms contribute) will be particularly useful in terms of guiding policymakers and antitrust regulators.

6 | CONCLUSION

Our findings provide additional empirical evidence of the potential price effects arising from healthcare system consolidation broadly and cross-market hospital acquisitions specifically. Our study also provides key guidance for antitrust enforcers and policymakers on the characteristics of health systems and acquisitions that are most likely to contribute to enduring price effects. More antitrust scrutiny of cross-market mergers – particularly those of serial acquirers – appears prudent given the current state of highly concentrated hospital markets in the United States.

ACKNOWLEDGMENTS

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APPENDIX A

ECONOMETRIC MODEL TECHNICAL DETAILS AND IDENTIFYING ASSUMPTIONS

De Chaisemartin and D'Haultfoeuille (Forthcoming)* (hereafter, dCDH) take the perspective of a social planner seeking to conduct a cost–benefit analysis comparing groups' (hospitals') actual treatments to the counterfactual "status-quo" scenario where every group would have kept the same treatment (i.e., not acquired) as in period 1. In our context, the planner wants to know if the cross-market mergers that took place over the entire duration of the study period led to prices and quality to be higher or lower. As the planner wants to compare groups' actual treatments D to the status-quo treatments, the dCDH parameters of interest and all of their analysis are conditional on D.

Consider the case where treatment is not binary, but ordered and discrete: $D \in \{1,\ldots,\underline{d}\}$ for $\underline{d} \geq 1$. For every g, let $T_g = F_{g'} \quad 1$ denote the last period where there is still a group with the same treatment as g's in period one and whose treatment has not changed since the start of the panel. For any g such that $F_g \leq T_g$, and for any $l \in \ 0,\ldots,T_g \quad F_g$, let $\delta_{g,l} = E\ Y_{g,F_g+l} \quad Y_{g,F_g+l}(D_{g,1},\ldots,D_{g,1})$ be the expected difference between group g's actual outcome at $F_g + l$ and the counterfactual "status quo" outcome it would have obtained if its treatment had remained equal to its period one value from period one to $F_g + l$. dCDH consider designs where (1) groups' treatments are always either weakly higher or always weakly lower than their period one treatments and (2) there is at least one group g experiencing a treatment increase (decrease) at a time period where there is at least another group g' with the same period one treatment as g whose treatment has not changed since the start of the panel. (1) is satisfied in our context because each additional year that a treated hospital acquires a cross-market hospital adds 1 to its treatment dose (i.e., treatment never decreases) and (2) is satisfied because our control group of hospitals maintain a treatment dose of 0 throughout the study period. de dCDH show that if (1) and (2) are true then their parameters of interest are well-defined and can be unbiasedly estimated.

The identifying assumptions outlined in dCDH for ordered and discrete treatments are (1) treatment does not vary within (g,t) cells, (2) no anticipation, and (3) for every hospital the expectation of the never-treated outcome follows the same evolution. Assumption (3) is a generalization of the standard parallel trends assumption in difference-in-differences models and we test for parallel trends using the placebo estimator in dCDH. Assumption 1 holds by construction in our setting and we do not observe any evidence of assumption 2 being violated.

For all (g,t), let $N_t^g = \sum_{g':D_{g',1}=D_{g,1},F_{g'}>t} N_{g',t}$ denote the number of observations at period t in groups g' with the same period one treatment as g, and that kept the same treatment from period 1 to t. Under the three assumptions in the prior paragraph, de Chaisemartin and D'Haultfoeuille (2022) show $DID_{g,l}$ is an unbiased estimator of $\delta_{g,l}$ if

$$DID_{g,l} = Y_{g,F_g+l} \quad Y_{g,F_g} \quad 1 \quad \sum_{g':D_{g',1}=D_{g,1},F_{g'}>F_g+l} \frac{N_{g',F_g+l}}{N^g_{F_g+l}} \ Y_{g',F_g+l} \quad Y_{g',F_g} \quad 1 \ .$$

$DID_{g,l}$ compares the $F_g \quad 1$-to-$F_g + l$ outcome evolution, in group g and in groups with g's period one treatment to period 1 to $F_g + 1$. Aggregating the $DID_{g,l}$ estimators into a DID_l estimator allows for the creation of an event study graph that has the distance to the first treatment change on the x-axis, the DID_l estimators on the y-axis to the right of zero, and placebo estimators on the y-axis. The resulting event study graph is useful to (1) test the parallel trends assumption and (2) provide reduced-form evidence of whether increasing the treatment for $l+1$ periods increases or decrease the outcome on average.

*De Chaisemartin C, D'Haultfoeuille X. Difference-in-Differences Estimators of Intertemporal Treatment Effects. *Rev Econ Stat*. Published online Forthcoming.

TABLE A1 Number of years that a treated hospital's system acquired a hospital more than 50 miles away between 2011 and 2017.

Number of years	Number of treated hospitals	Number of treated hospitals' systems
1	32	17
2	43	9
3	43	9
4	28	6
5	16	3
6	30	2
7	22	1
Total	214	47

Note: Treatment hospitals included hospitals (or hospitals within systems) that met the following criteria: (1) hospitals that made an acquisition from 2009 to 2017 of a hospital (or system) that was further than 50 miles away, with the first acquisition occurring from 2011 to 2015; and (2) hospitals that were never a target of an acquisition from 2009 to 2017. For example, a treated hospital whose system acquired one or more hospitals that were more than 50 miles away from it in 2011, 2013, and 2016 (3 years between 2011 and 2017) was included in the row in which the "Number of Years" column equaled 3. Control hospitals were never part of merger activity (either as a target or acquirer) from 2009 to 2017.

TABLE A2 Price event study regression coefficient estimates underlying Figure 1.

	(1)
	ln (price)
$t = 4$	0.020
	(0.025)
$t = 3$	0.010
	(0.010)
$t = 2$	0.012
	(0.014)
$t = 0$	0.013
	(0.017)
$t = 1$	0.008
	(0.034)
$t = 2$	0.029
	(0.023)
$t = 3$	0.061***
	(0.020)
$t = 4$	0.072**
	(0.032)
$t = 5$	0.054**
	(0.026)
$t = 6$	0.121**
	(0.059)
Observations	10,521
Time-varying control variables	Yes
Fixed effects	Hospital, Year

Note: Standard errors are in parentheses and were estimated using 100 bootstrap replications clustered at the hospital level. The coefficients estimates are depicted in Figure 1 in the main text; $t = 1$ is the omitted reference period. The time-varying control variables are described in the data section of the main text. ***$p < 0.01$; **$p < 0.05$; *$p < 0.1$.

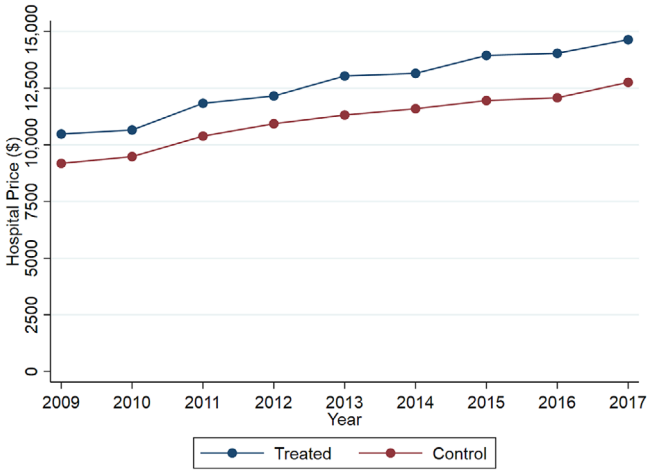


FIGURE A1 Unadjusted price trends for treated and control hospitals. Average hospital prices across the 214 treated hospitals and 955 control hospitals in our analytic sample. By construction the treated group includes only hospitals that were first treated during the 2011–2015 window of our study period (2009–2017). The breakdown by treatment year for the 214 treated hospitals is 80 in 2011, 31 in 2012, 49 in 2013, 37 in 2014, and 17 in 2015.

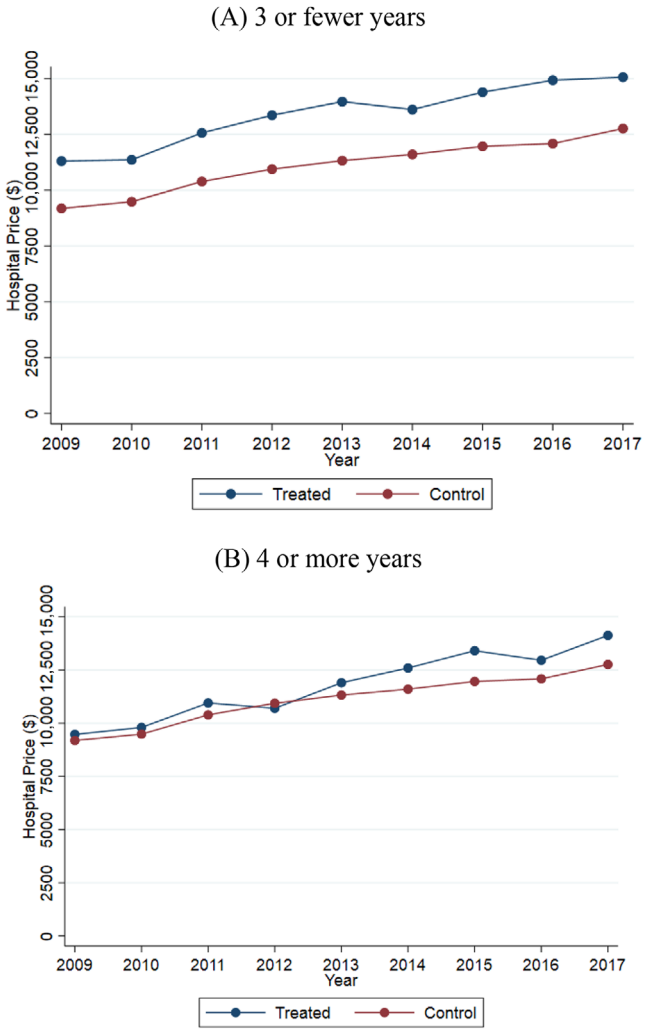
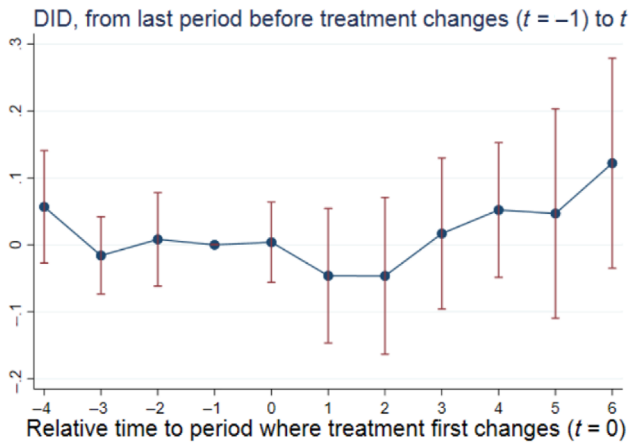


FIGURE A2 Unadjusted price trends for treated and control hospitals by number of years from 2011 to 2017 that treated hospitals' systems acquired hospitals across markets. (A) 3 or fewer years. (B) 4 or more years. Average hospital prices across the 214 treated hospitals and 955 control hospitals in our baseline sample. Panel A shows the average price across the 118 treated hospitals that were part of systems that acquired cross-market hospitals in 3 or fewer years from 2011 to 2017. Panel B shows the average price across the 96 treated hospitals that were part of systems that acquired cross-market hospitals in 4 or more years from 2011 to 2017. The control group line is the same in Panels A and B and is the same control group line plotted in Figure A1.

(A) Out-of-state



(B) In-state

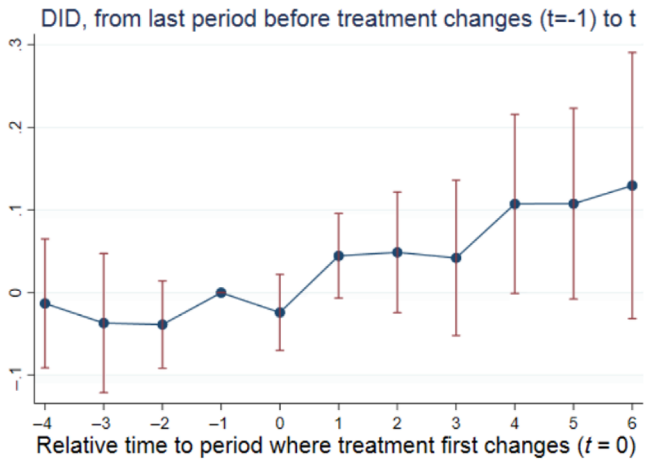


FIGURE A3 Price event study results – out-of-state vs. in-state cross-market mergers. (A) Out-of-state. (B) In-state. Standard errors were estimated using 100 bootstrap replications clustered at the hospital level. Panel A includes the 68 treated hospitals that were only out-of-state cross-market acquirers between 2011 and 2017. Panel A includes the 60 treated hospitals that were only in-state cross-market acquirers between 2011 and 2017. The remaining 86 (=214–68-60) treated hospitals were excluded from this analysis because they were part of systems that made both in-state and out-of-state cross-market acquisitions during the study period. The regressions underlying these event study plots included hospital and year fixed effects as well as the time-varying hospital- and county-level control variables described in the data section of the main text.

ATTACHMENT #2

California Nurses Association, Supplemental Comments

to the California Law Revision Commission

Antitrust Law - Study B-750, Mergers and Acquisitions

Arnold D (Oct. 2021), "Mergers and Acquisitions, Local Labor Market Concentration, and Worker Outcomes," Mimeo, https://darnold199.github.io/madraft.pdf.

Mergers and Acquisitions, Local Labor Market Concentration, and Worker Outcomes*

David Arnold†

October 29, 2021

Abstract

I use matched employer-employee data from the U.S. to estimate both the direct and market-level effects of mergers and acquisitions (M&As) and resulting labor market concentration changes on worker outcomes. To measure local concentration, I derive an index of concentration that uses job-to-job mobility patterns to measure substitutability across industries. M&As that increase local labor market concentration have negative impacts on worker earnings with the largest impacts in already concentrated markets. This is true for both workers employed in the merging firms, as well as for workers at other firms in the same labor market.

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1 Introduction

About 2 percent of all workers each year are employed in an establishment that changes ownership. While antitrust authorities have historically focused on consumer welfare, new evidence linking poor labor market outcomes to both labor and product market concentration (Barkai, 2016; Autor et al., 2020; Azar et al., 2020; Benmelech et al., 2020; Rinz, 2020) has spurred recent policy debates on whether regulatory agencies should pursue new policies to protect workers (Hemphill and Rose, 2017; Marinescu and Hovenkamp, 2019; Naidu et al., 2018). However, estimating the causal effect of concentration on labor market outcomes is complicated for two key reasons. First, concentration requires a market definition, which is often difficult to define and frequently contentious. Second, many factors change both concentration and earnings leading to endogeneity issues that can yield misleading correlations (Berry et al., 2019; Syverson, 2019).

This paper provides evidence on the impacts of M&A and local labor market concentration on workers using matched employer-employee data from the U.S. Census. The analysis is composed of four parts. First, I derive an index of concentration that incorporates data on job-to-job flows to measure substitutability between jobs in different industries. In this way, I provide a data-driven approach to address the difficult task of defining a labor market. Second, I estimate the direct impact of M&A on workers in M&A firms, which could be driven by changes in local labor market concentration, productivity, or product market power. Third, I estimate market-level effects of increased local labor market concentration due to merger activity. Fourth, I calibrate the Cournot model using the reduced-form estimates to determine whether changing labor market concentration has contributed to macroeconomic trends such as the falling labor share and stagnant wage growth. I now describe each of these parts in greater detail.

In the first part of the paper, I derive a simple Cournot model with three channels through which M&A impacts workers. First, increases in local labor market concentration will lower competition for workers and reduce wages and employment. Second, increases in product market power will incentivize firms to reduce quantities, resulting in falling employment with ambiguous impacts on wages.[1] Third, changes in the production process may increase productivity (e.g. better management practices (Bloom and Van Reenen, 2007; Lazear et al., 2015)) resulting in higher wages for workers, though some jobs may become redundant and eliminated. I use variation across mergers to disentangle these channels. In particular, I explore heterogeneity by initial concentration, the size of the concentration change, and whether the firm produces a tradable or nontradable good.

Relative to a standard Cournot model, the key extension is that the wage in a given industry depends on both the total employment within that industry, as well as the weighted total employment in all other industries within the commuting zone. The weights depends on the substitutability between jobs in different industries, which I estimate using worker flows across industries. The

[1] In many models of monopsony power (e.g. Card et al. (2018); Berger et al. (2021)), wages depend on the labor demand, and not directly on the profits of firms. In these models, reductions in employment will result in reductions in wages regardless of whether firm profitability increases following a merger. In bargaining models, however, the surplus of the firm increases following M&A, resulting in higher wages for incumbent workers (He, 2018).

model yields a simple relationship between a flows-adjusted concentration measure (that depends on the estimated weights between industries) and market wages. Intuitively, even if a given industry is comprised of only a few firms, the labor market for workers in this industry may not be concentrated if the workers routinely move to jobs in different industries.

In the second part of the paper, I estimate the direct impact of M&A on workers using a difference-in-differences design that compares outcomes for M&A workers to a matched control group before and after an M&A event. To identify M&A events, I use enterprise-level identifiers in the Longitudinal Business Database (an establishment-level panel for the U.S.) to discern when establishments change ownership.[2] To study the impact on worker-level earnings, I use the Longitudinal Employer Household Dynamics (LEHD) survey, a matched employer-employee dataset built from state unemployment insurance records. For this project I have access to 26 states. The worker-level data is crucial for two reasons. First, it allows me to compute job-to-job flows across industries which is an important component of the flows-adjusted measure of local labor market concentration. Second, it allows me to control flexibly for worker composition by tracking the same workers over time. In total, I identify roughly two million incumbent workers in M&A firms between the years 1999-2009.

I find that M&A workers' earnings remain stable in M&As that have negligible impacts on local labor market concentration. In stark contrast, mergers that have positive predicted impacts in local labor market concentration result in a 2.1 percent decline in M&A workers' earnings relative to the matched control, with larger declines in already concentrated markets. While employment declines are larger in mergers that increase local concentration (16.5 percent), mergers with no impact on local concentration still result in economically meaningful declines in employment (13 percent). The large declines in employment with negligible impacts on wages can be rationalized through a model in which firms hire a set of workers to meet the fixed costs of production (sometimes referred to as overhead labor). After a merger, some of these positions may become redundant, leading to layoffs.

In tradable industries, I continue to find negative impacts on wages only in mergers that increase local labor market concentration, suggesting the effects are not driven by changes in product market power. I find similar patterns in a sample of mergers between firms operating in multiple commuting zones, for which local economic conditions likely did not trigger the M&A. This evidence is therefore consistent with M&A reducing wages through increased monopsony power in the labor market. However, these direct effects understate the impact of M&A on workers if increased local concentration reduces wages for all firms in the labor market.

In the third part of the paper, I estimate the market-level effects of increased local labor market concentration due to merger activity. As discussed previously, interpreting negative correlations between local labor market concentration and market wages as evidence of imperfect competition

[2]There are some complications that arise by using this method to identify ownership changes which deal with how the Census classifies single-unit vs. multi-unit firms and is discussed in Section 3. I follow the approaches utilized in (Maksimovic and Phillips, 2001; Tate and Yang, 2016; Atalay et al., 2019) who also use the LBD to identify changes in ownership. A similar approach is used in He (2018) with Danish administrative data.

in labor markets remains controversial due to potential endogeneity issues. In contrast to this prior literature, I estimate the elasticity of earnings with respect to *merger-induced* changes in local concentration, which is both theoretically justified as well as directly relevant to antitrust authorities.

I find that the largest (top-ventile) of merger-induced concentration changes cause decreases in market-level earnings. Average earnings fall by about 3.3 percent in these top-ventile markets relative to other markets. Importantly, this analysis excludes merging firms, implying that the effect is entirely driven by impacts at *other* firms competing in the same labor market. Therefore, changes in productivity or management practices at merging firms cannot explain the presence of these impacts. Using a top-ventile change as an instrument for concentration yields an elasticity of earnings with respect to local concentration equal to -0.22. This estimate is consistent in a sample of tradable industries as well as for national mergers. The point estimate is similar in magnitude to recent work that finds elasticities from -0.01 (Hershbein et al., 2018) to -0.28 (Qiu and Sojourner, 2019).[3]

In the fourth part of the paper, I use the market-level estimates in combination with the Cournot model to assess whether changes in local concentration and M&A activity contribute to important labor market trends. Monopsony power has been posed as a potential source of stagnant wage growth for low-income workers (Krueger and Posner, 2018) and the falling labor share (Barkai, 2016), with lack of antitrust action as a potential contributing factor (Marinescu and Hovenkamp, 2019; Naidu, Posner and Weyl, 2018). To inform these issues, I use the model to transform the distribution of concentration across markets into implied wage markdowns and document how this has changed over time. Then, to consider the role of antitrust scrutiny, I estimate what fraction of mergers could have been blocked on the basis of increased labor market power.

I find local concentration depresses wages by about 4-5 percent relative to a fully competitive benchmark, with a slight downward trend since the late 1980s. Therefore, changes in local concentration cannot rationalize stagnant wage growth or the declining labor share documented in the literature. These results do not necessarily imply that monopsony power in general has been decreasing over this time period. Local concentration is only one source of monopsony power. Declining unionization rates (Farber et al., 2018) or increases in non-competes and no-poaching agreements (Krueger and Ashenfelter, 2018; Krueger and Posner, 2018) could lead to rising monopsony power even in the presence of falling local concentration.

Lastly, I consider what these results imply for antitrust scrutiny of mergers. I find that a hypothetical antitrust authority that blocks any merger that decreases market-level wages by at least 5 percent would block about 1.2 percent of the mergers in the analysis sample. In product markets, a predicted 5 percent increase in prices is considered large enough to warrant antitrust enforcement. The hypothetical fraction of blocked mergers based on labor market power is only slightly smaller than the actual fraction challenged by antitrust authorities in the United States.[4]

[3] The estimates in both of these papers vary somewhat depending on the exact specification.

[4] This comparison comes with a number of caveats that are discussed in detail in Section 6.6.2. There is recent evidence of antitrust scrutiny having a deterrence effect (Wollmann, 2019), suggesting the fraction of mergers that are

I interpret this as evidence that the labor market is an important market for which antitrust scrutiny is relevant, but likely only for very large mergers that generate considerable shifts in local concentration. The evidence, however, does not support the conclusion that lack of antitrust scrutiny for labor markets has been a major contributor to labor market trends such as the falling labor share or stagnant wage growth. Most mergers do not generate large shifts in concentration and I find no evidence that the number of anticompetitive mergers in labor markets has been increasing over time.

This paper contributes to three distinct literatures. First, it contributes to the literature on the anticompetitive effects of mergers and acquisitions. There is a long theoretical and empirical literature in industrial organization studying the impacts of M&A on consumer welfare (Dansby and Willig, 1979; Hart et al., 1990; Farrell and Shapiro, 1990; Nevo, 2000; Kaplow and Shapiro, 2007; Dafny et al., 2012; Gowrisankaran et al., 2015; Miller and Weinberg, 2017). Recently, a number of papers argue that antitrust should also consider monopsonistic impacts of M&A (Hemphill and Rose, 2017; Marinescu and Hovenkamp, 2019; Naidu, Posner and Weyl, 2018). Recent work in industrial organization mostly relies on estimating structural demand models and simulating mergers to understand the impacts on prices and welfare. In contrast, I use a matched difference-in-differences design to identify labor market impacts on a sample of completed mergers. This study therefore contributes to the smaller but growing literature on "retrospective" merger analysis in industrial organization (Ashenfelter et al., 2013, 2015; Cooper et al., 2019; Dafny et al., 2019).

Second, this paper contributes to a smaller literature that studies the impact of M&A on workers. Brown and Medoff (1988) find that acquisitions in Michigan result in lower wages and increased employment. Siegel and Simons (2010) studies M&A in Sweden and finds increases in productivity but decreases in employment. He (2018) studies M&A in Denmark and finds no impact on employment but negative effects on wages, and argues this is caused by high-wage managers being replaced in target establishments. This is consistent with Shleifer and Summers (1988) who argue that M&A events will reduce wages if managers are replaced after a takeover. The key distinctions between this paper and He (2018) is that I additionally focus on market-level effects of merger activity. These market-level effects are not predicted by models in which negative wage losses are driven by within-firm reorganizations after an M&A event, as in Shleifer and Summers (1988). Currie et al. (2005) and Prager and Schmitt (2021) both study mergers in hospitals and find evidence of increased monopsony power. Relative to these papers, I study a large sample of M&A in the United States and isolate the role of local labor market concentration in explaining heterogeneity in effects across mergers.

Lastly, this paper relates to the literature on imperfect competition in labor markets. A long literature in economics has argued that firms have some latitude to set wages (Robinson, 1933). A number of recent papers have found evidence of imperfect competition in labor markets (Hirsch et al., 2010; Ransom and Sims, 2010; Staiger et al., 2010; Manning, 2011; Depew and Sørensen, 2013; Hirsch et al., 2010; Webber, 2015; Naidu et al., 2016; Cho, 2018; Dube et al., Forthcoming;

blocked due to antitrust legislation is actually larger than the fraction challenged in practice by antitrust authorities.

Kline et al., 2019; Goolsbee and Syverson, 2019; Lamadon et al., 2019). One strand of this broader literature argues local labor market concentration plays a role and documents a robust negative relationship between different measures of labor market concentration and wages (Azar et al., 2020; Benmelech et al., 2020; Hershbein et al., 2018; Rinz, 2020; Qiu and Sojourner, 2019). The methods used to measure concentration in this paper build on recent work that utilizes microdata to inform the definition of the labor market (Schmutte, 2014; Nimczik, 2017; Jarosch et al., 2019) or obtain a measure of outside options (Caldwell and Danieli, 2019) and compensating differentials (Sorkin, 2018).

The structure of the paper is as follows. Section 2 develops a model that illustrates channels through which M&A activity may impact workers and then links these impacts to local labor market concentration. Section 3 discusses the institutional details, data, and measurement of concentration in the data. Section 4 describes the research design. Section 5 estimates the direct impact of M&A on incumbent establishments and workers. Section 6 estimates the market-level impacts of merger activity due to increased concentration in the labor market. Section 7 concludes.

2 A Model of Imperfect Competition in the Labor Market

In this section, I present a Cournot model of the labor market that clarifies the channels through which M&A events could impact the labor market. I then discuss assumptions that can be maintained to disentangle these channels. I conclude by extending the standard model to allow for a data-driven approach to measuring labor-market concentration.

2.1 Cournot Model of the Labor Market

I assume firms in a given market compete in the labor market à la Cournot. This assumption generates a simple relationship between market-level earnings and the Herfindahl-Hirschmann Index (HHI), which is commonly used in antitrust analysis to predict anticompetitive effects of mergers and acquisitions.[5] While the main text focuses on the Cournot model, there are a number of potential models that can be used to link concentration and earnings, including a dominant firm model (Landes and Posner, 1981), a general equilibrium oligopoly model as in Berger et al. (2021), or a search model Jarosch et al. (2019). Qualitatively, the insights from each model are similar. Mergers with larger shifts in concentration in already concentrated markets will have the largest impacts on wages. However, the relevant concentration measure will vary across models. For example, in the dominant firm model, the share of the labor market employed by the largest firm is the model-relevant concentration measure.

To begin, I assume there are $N_{\not}$firms hiring in a given labor market m. Later, when turning to empirics, a market $m_{\not}$will be an industry (4-digit NAICS) within a commuting zone. Each commuting zone should be thought of as an isolated island that does not interact with other

[5]This model is used in Krueger and Ashenfelter (2018) to explore potential impacts of restrictions on hiring from other units within a franchise.

commuting zones. For now, I ignore substitutability across industries within a commuting zone although this will be a crucial factor in measuring labor market concentration in the next section.

An individual firm chooses l_j to maximize total profits:

$$\pi_j = R_j(l_j) - w_m(L_m)l_j, \tag{1}$$

where $R_j(l_j)$ is the revenue of firm j when employing l_j workers. This function in general may depend on product-market parameters, such as the degree of product-market competition, as well as productivity of firm j. Taking the first-order condition with respect to l_j yields:

$$\theta_j - \frac{\partial w_m(L_m)}{\partial l_j} l_j - w_m(L_m) = 0 \tag{2}$$

Given $L_m = \sum_j l_j$, $\frac{\partial w_m(L_m) l_j}{\partial l_j} = \frac{\partial w_m(L_m) l_j}{\partial L_M}$. Dividing by w_m and rearranging yields:

$$\frac{\theta_j}{w_m} = \frac{\partial w_m(L_m)}{\partial L_m} \frac{l_j}{w_m} \frac{L_m}{L_m} + 1 \tag{3}$$

The market-level elasticity of labor supply is denoted η_m and is equal to $\frac{\partial w_m(L_m)}{\partial L_m} \frac{L_m}{w_m}$. Therefore rearranging further yields:

$$\frac{\theta_j}{w_m} = \frac{s_j^l}{\eta_m} + 1, \tag{4}$$

where s_j^l is the share of labor in market m that is employed by j. Finally, summing up all N firms first-order conditions yields:

$$\sum_j s_j^l \frac{\theta_j}{w_m} = \sum_j s_j^l \left(\frac{s_j^l}{\eta_m} + 1 \right) = \frac{HHI}{\eta_m} + 1 \tag{5}$$

where $HHI = \sum_j (s_j^l)^2$ is the Herfindahl-Hirschman index based on employment shares. Therefore, letting θ_m be the average value of marginal product in the market, the market wage is equal to:

$$w_m = \left(\frac{\eta_m}{HHI + \eta_m} \right) \theta_m \tag{6}$$

In this model, wages are marked down relative to the average marginal product θ_m in the market. The markdown depends on two factors. First, as the elasticity of labor supply increases ($\eta_m \to \infty$), wages converge to marginal product. Intuitively, if workers are not tied to this particular market, then even small decreases in wages will generate large declines in the number of workers, incentivizing firms to pay a wage equal to the average marginal product of workers. The markdown also depends on overall concentration in the market (HHI). As concentration increases, wages decrease (conditional on η_m and θ_m). In the next section, I discuss how the various parameters of this wage equation may change in response to merger activity, and what variation in the data will prove useful for disentangling channels.

2.2 Potential Impacts of M&A Events

Product-Market Impacts: In this model, if product market power increases, then firms will restrict quantities to increase price. The reduction in quantity produced will lead to an overall lower level of employment (assuming fixed productivity). Given $w_m(L_m)$ is increasing in L_m, this will imply an overall lower level of wages in the labor market.

One important point to keep in mind, however, is that alternative models of wage setting may yield different predictions. For example, in Appendix C.5, I illustrate a simple wage bargaining model that has the opposite prediction. In that model, wages depend on the surplus at the firm. If profits increase, but employment levels fall, then the wages for the workers that remain employed will increase, as the total (higher) surplus is now split between fewer workers.

In either case, the important point to take away is that changes in product-market power will have impacts on wages, even absent monopsonistic impacts. Therefore, when turning to empirics, it will be important to disentangle these two channels.

Productivity Impacts: A common justification for mergers is the possibility of increased productivity. For example, Braguinsky et al. (2015) finds evidence of increased productivity in the Japanese cotton spinning industry after acquisitions, while Blonigen and Pierce (2016) finds little evidence of increased productivity in manufacturing acquisitions in the U.S. Additionally, prior work has found that misaligned empire-building incentives (Jensen, 1986) or CEO overconfidence (Malmendier and Tate, 2005) may drive M&As, suggesting that M&As could actually destroy value and lower productivity. Therefore, overall, the impact of M&As on productivity is ambiguous. Again, a key takeaway here is that many firm-specific factors could impact wages after a merger absent monopsonistic impacts.

Monopsonistic Impacts: Lastly, changes in labor-market competition due to the merger will impact wages. This can be seen clearly by the fact that the market wage depends on the level of concentration in the labor market, HHI. Additionally, while the model is implicitly assuming η_m is a fixed feature of the market, one could imagine that η_m is determined by other factors that determine the level of monopsony, such as search costs and market regulations. If these factors are also impacted by M&A, resulting in a decrease in η_m, then this will also lead to lower market wages.

A final channel that is related to monopsonistic impacts, but conceptually distinct, is changes in bargaining power for workers after a merger. For example, Shleifer and Summers (1988) propose that M&A may lower wages as high-wage managers are replaced, a finding that is supported in He (2018).

2.2.1 Disentangling Impacts

Within-Firm vs. Market-Level Effects: The analysis of the impacts of M&A is composed of two separate empirical designs: effects on workers within M&A firms and market-level effects that ex-

clude workers directly employed by the M&A firms. These two separate analyses are important not only to understand the total impacts of M&A on the labor-market, but also to understand the channels through which they arise. For example, many of the productivity channels would be unable to rationalize market-level declines in earnings. In particular, impacts due to ownership changes, such as those emphasized in the corporate finance literature, would be unable to explain why other firms in the same labor-market alter wages. Therefore, existence of market-level effects will be used to eliminate some alternative stories for observed wage declines, such as breach of trust in hostile takeovers discussed in Shleifer and Summers (1988).

Tradable vs. Nontradable Industries: To disentangle wage effects due to product market competition and labor market competition, I compare differences between firms that sell tradable vs. nontradable goods. The logic is that firms that sell highly tradable goods are close to perfectly competitive, and therefore, a single merger is unlikely to have large impacts on product market power. For example, a merger between two coal mines is unlikely to change the national price of coal. This assumption is often maintained in the literature on local labor markets (Moretti, 2011) while the international trade literature often models industries as being composed of a continuum of firms, again implying a single merger will not impact prices. However, some tradable industries are quite concentrated at a national level. Therefore, I also consider impacts in tradable industries for which national concentration is relatively low.

Changes in Labor-Market Concentration: Lastly, I consider how effects of mergers vary by the change in concentration in the local labor market. Before discussing this in detail, it should be noted that the recent literature on monopsony power in labor markets has generally used interactions between industry and region or occupation and region to define labor markets. However, some industries and occupations are very specific and there is considerable mobility across both industries and occupations in the data (Moscarini and Thomsson, 2007; Kambourov and Manovskii, 2008; Groes et al., 2014). Appendix Table A1 computes the probability a job transition is within a given occupation or industry cell using data from the CPS (1995-2014). In column 1, I find that conditional on switching jobs, the probability the job transition is within the same 4-digit industry is 36.6 percent. Turning to column 3 in Appendix Table A1, I find that conditional on switching jobs, the probability the job transition is within the same 3-digit occupation is about 34.9 percent, slightly lower than the probability of a within-industry transition. Therefore, regardless of whether industry or occupations are used to construct labor markets, it is important to consider the possibility of significant transitions outside of the proposed labor-market definition.

Given the ambiguity regarding the appropriate market definition, the next section extends the Cournot model discussed above to incorporate substitutes directly into the wage equation. Instead of wages in industry m being a function of employment only in m, the wage will now depend on the employment in both the industry m as well as all other industries within the commuting zone. However, industries in which a worker in m is unlikely to transition to will be down-weighted.

After the new measure is constructed I discuss how variation in the effects of mergers by changes in predicted concentration will be an important component of the empirical analysis.

2.2.2 Incorporating Substitutes to Calculate Concentration

For a worker currently employed in industry m, I denote sum value of an allocation of employment across industries $\{L_1, ..., L_M\}$ as $\bar{V}_m = \sum_{k=1}^{M} V(k|m)L_k$, where $V(k|m)$ represents the value of a job in industry k for a worker currently employed in industry m. I assume the market wage in m is a direct function of this sum utility. Intuitively, this setup tries to capture how the availability of substitutes impacts wages. For example, imagine two commuting zones with the same level of employment in hospitals. In the simple version of the model, we would expect the wages to be exactly the same in the two commuting zones (assuming equal productivity and market elasticities of labor supply). However, imagine one of the commuting zones also has a very large nursing care facilities market. Jobs in this industry provide relatively high utility for workers in the hospital industry (i.e. $V(k|m)$ is large). Therefore, under the extended model, we would expect the wages for nurses at hospitals to be higher in the commuting zone with more skilled nursing facilities.

How should $V(k|m)$ be measured in practice? I argue that endogenous flows across markets are helpful in measuring $V(k|m)$ in the data, similar to Sorkin (2018) who uses flows between firms to estimate the value of a given firm.[6] To see this, let $U_i(k|m) = ln(V(k|m)) + \xi_i$ be the utility of a job in market k for worker i who is currently employed in market m. $ln(V(k|m))$ is a term that is common to all workers in market m, while ξ_i is an idiosyncratic shock that captures heterogeneity across workers. I assume job offers arrive at a market-specific rate λ_m. When a job arrives, the worker must decide whether to remain in the current job or move to the new job. The probability we observe a worker from m move to a job in market k is given by:

$$P(k|m) = \lambda_m \cdot f_k \cdot Pr(k \succ m), \tag{7}$$

where f_k denotes the probability that the offer comes from a firm in market k and $Pr(k \succ m)$ denotes the probability the offer from a firm in market k yields higher utility for the worker than the current job in market m. I assume the idiosyncratic shock, ξ_i, is distributed type I extreme value. This implies the probability we observe a job transition from m to k relative to a job transition within market m is given by:

$$\frac{P(k|m)}{P(m|m)} = \underbrace{\frac{f_k}{f_m}}_{\text{relative offers}} \cdot \underbrace{\frac{V(k|m)}{V(m|m)}}_{\text{relative values}} \tag{8}$$

[6] The goal here is to understand what firms within a commuting zone are competing against each other. To do so, I use flows across industries to determine which industries compete against each other. Theoretically, one could use bilateral flows to measure competition between two firms, however the job-to-job network at the firm-level is quite sparse, making these competition measures likely poorly estimated. Sorkin (2018) uses a recursive algorithm similar to Google's page rank algorithm to identify an absolute ranking of firm's, however, this approach doesn't necessarily identify which firms compete with one another in the labor market.

The average utility of a market is only identified up to scale, therefore I normalize $V(m|m) = 1$. This implies $V(k|m)$ can be solved for in Equation (8):

$$V(k|m) = \frac{P(k|m)}{P(m|m)} \cdot \frac{f_m}{f_k} \tag{9}$$

In practice, I do not observe the distribution of offers from different markets. To proceed, I assume offers are a linear function of market size (i.e. $f_m = \kappa L_m$ for some $\kappa > 0$). This implies that I can replace the ratio of offers with the relative size of the markets, yielding:

$$V(k|m) = \frac{P(k|m)}{P(m|m)} \cdot \frac{L_m}{L_k} \tag{10}$$

Note that everything on the right hand side of Equation (10) can be measured with data on job-to-job flows and industry employment. Going forward, I denote the estimated value in Equation (10) as $\hat{}_{m\to k}$ to distinguish it from the theoretical object, $V(k|m)$. We can now substitute in for $V(k|m)$ in order to write the wage in market m as a function of observables:

$$w_m(\bar{V}_m) = w_m(\sum_{k=1}^{M} \hat{}_{m\to k} L_k) \tag{11}$$

Let $\tilde{s}_j$ denote the market share of firm j:

$$\tilde{s}_j = \frac{l_j}{\sum_{k=1}^{M} \hat{}_{m\to k} L_k} \tag{12}$$

This market share depends on the employment in all firms in the commuting zone. However, firms in industries that workers in market m rarely transition to will receive very low weight. The log market wage is now given by:

$$\tilde{w}_m = \tilde{\theta}_m + ln\left(\frac{\eta_m}{C + \eta_m}\right) \tag{13}$$

where $C = \sum_j \tilde{s}_j^2$ is defined as the flows-adjusted concentration measure, η_m is equal to $\frac{\partial w_m}{\partial \alpha L} \frac{L}{w_m}$, and $L = \sum_{k=1}^{M} \hat{}_{m\to k} L_k$. This wage equation leads to the following two propositions regarding the impact of mergers on wages, both of which will be important in understanding heterogeneity in earnings effects across mergers. For both propositions, I assume no changes in product-market parameters or firm productivity. These assumptions can be rationalized by focusing on market-level effects (i.e. excluding M&A workers and therefore excluding changes driven by changes in productivity at M&A firms) in mergers in tradable goods industries (i.e. eliminating product-market impacts).

Proposition 1. *Conditional on the market-level elasticity and initial concentration (C_0), wages decline more in mergers that generate larger shifts in concentration (ΔC).*

This proposition rationalizes the use of predicting changes in concentration to predict anticompetitive impacts of merger. However, it also highlights the importance of controlling for initial

concentration and market-level elasticities. In particular, regarding initial concentration, it is easy to prove the following proposition:

Proposition 2. *Conditional on the market-level elasticity and the change in concentration (ΔC), wages decline more in mergers in more concentrated markets (C_0).*

To see this, one can differentiate Equation (13) with respect to $\tilde{C}$, which yields the following formula for the elasticity of wages with respect to concentration:

$$\frac{\partial \tilde{w}}{\partial \tilde{C}} = -\frac{C\psi}{C\psi + \eta_m} < 0 \tag{14}$$

Note that if the $C\psi$ is very low, the marginal effect of an increase in $C\psi$ will be small. That is, shifting concentration from very low levels to still low levels will not cause an appreciable decrease in wages. However, impacts will be larger at higher concentration levels. This nonlinearity is reflected in the Horizontal Merger guidelines. For example, while an increase in HHI of around 0.02 is not usually a concern in unconcentrated markets ($HHI\psi < 0.15$), the same size increase in concentrated markets ($HHI\psi > 0.25$) does raise antitrust concerns. When turning to empirics, both the size of the concentration change as well as the initial concentration will be important in predicting negative impacts of mergers and acquisitions on workers.

2.3 Relationship to IO Literature and Wage-Concentration Regressions

A recent literature finds a robust negative relationship between local labor market concentration and wages.[7] However, interpreting this evidence as causal remains controversial due to two main issues. The first issue, as discussed above, is due to measurement errors that arise due to potentially arbitrary market definitions.

The second issue, as discussed in Berry et al. (2019) and Syverson (2019), is that there are many factors that may impact both concentration and market outcomes. Therefore any given correlation can be rationalized in a number of ways. For example, increased import competition can rationalize the negative correlation between wages and concentration even if markets are perfectly competitive. If increased import competition causes low productivity firms to exit the market (Bernard et al., 2006), then the fall in labor demand will cause wages to fall (Autor et al., 2013; Dix-Carneiro and Kovak, 2017). Therefore, wages will be negatively correlated with increases in concentration, but in this case the correlation has nothing to do with monopsony power.[8] This issue is the primary reason why the industrial organization literature mostly abandoned using concentration indices to proxy for market power.

How are these issues addressed in this paper? The first issue involving market definition is discussed in detail in Section 2.2.2. While I define the labor market at the 4-digit NAICS by

[7] See Azar et al. (2020); Benmelech et al. (2020); Hershbein et al. (2018); Rinz (2020); Lipsius (2018) among others. An older literature (Weiss, 1966) studies the impact of product-market concentration on labor market earnings.

[8] Benmelech et al. (2020) controls for the "China-shock" in Autor et al. (2013) and continues to find a negative relationship between market concentration and wages, indicating it is unlikely this correlation is driven entirely by trade-induced shocks to labor demand.

commuting zone level, I directly incorporate flows across industries into the market concentration measure. To address the second issue I use variation in concentration driven solely by merger activity. Therefore, while there are multiple pathways from concentration to labor market outcomes, I isolate variation driven by merger activity and show that this variation predicts outcomes in a large sample of mergers.

3 Institutions, Data, and Measurement

3.1 Antitrust in the United States

In the United States, the Department of Justice and Federal Trade commission are tasked with blocking mergers that harm competition. The 1976 Hart-Scott Rodino Act requires merging entities to notify antitrust authorities before a transaction takes place. There are exemptions that depend on a number of factors, the most important being the value of the target firm's assets (Wollmann, 2019). Mergers in which the target firm's assets are below 50 million USD are generally exempt from scrutiny, presumably because mergers below this threshold are assumed to have no impacts on product market competition.[9] In general, however, most of the deals that the FTC and DOJ do get notified about are allowed to proceed without interference. Figure A2 reports the fraction of notifications that face some sort of antitrust enforcement for the years 1999-2009. Most of these challenges by the DOJ and FTC do not lead to federal litigation, but instead the firms either modify the deal or abandon it altogether. On average during this time period, about 1.9 percent of all notifications face some enforcement from antitrust authorities.[10]

In practice, no merger has ever been challenged due to reducing competition in the labor market. However, challenging M&A due to anticompetitive impacts on labor markets does not require altering the current law (Naidu et al., 2018; Marinescu and Hovenkamp, 2019; Hemphill and Rose, 2017). The Horizontal Merger guidelines state that the laws do not differentiate between "seller" power or "buyer" power. While challenging a merger based on buyer power is possible, the guidelines analytical framework almost exclusively focuses on effects due to product market power.

While no merger has been ever been challenged due to a predicted increase in labor market power, employers have been charged with anticompetitive practices in labor markets. For example, in 2017, a number of animation studios including Disney, Pixar, Dreamworks, Sony and 20^{th} Century Fox Animation were sued for agreeing not to poach workers from each other. The studios settled and agreed to pay $160 million USD to the impacted employees. Since the settlement, both Pixar and 20^{th} Century Fox Animation have been purchased by Disney. Therefore, any wage suppression that occurred due to the no-poach agreement between these firms would be completely

[9] Wollmann (2019) finds that there was an increase in newly-exempt mergers after the threshold was moved from 10 million to 50 million in 2001, which suggests some firms will not go through a merger due to deterrence effects of antitrust scrutiny.

[10] Author's calculation derived from *Hart-Scott Rodino Annual Reports* which reports statistics on merger enforcement actions at the DOJ and FTC.

legal, as these firms are all owned by the same parent company.[11]

3.2 Data

There are two datasets used for the analysis. First, I use the Longitudinal Business Database (LBD), an establishment-level dataset that covers the universe of non-farm employment in the United States. Second, I use the Longitudinal Employer Household Dynamics (LEHD) survey, a matched employee-employer dataset constructed from state unemployment insurance (UI) records. The version I have access to for this project covers 26 states in the United States. To prevent disclosure of potentially confidential information, the Census Bureau requires researchers to round estimates and observation counts.

3.2.1 Longitudinal Business Database (LBD) Establishment-level Data

In the LBD, an establishment is defined as a specific physical location where business occurs. The LBD contains information on payroll, employment, industry, and location. In addition to establishment-level identifiers, the LBD contains enterprise-level identifiers, where an enterprise reflects all establishments under common ownership control.[12] Importantly for this project, when an establishment changes ownership, the enterprise identifier changes, while the establishment-level identifier remains stable. Therefore, M&A activity can be inferred by observing when enterprise-level identifiers change (Maksimovic and Phillips, 2001; Tate and Yang, 2016; Atalay et al., 2019).[13] Enterprise-level identifiers may also change when a single establishment becomes a multi-unit firm. Therefore, I drop cases in which a single unit firm becomes a multi-unit firm, as these likely do not reflect merger activity.

The key outcome variables are employment (which is equal to March 12^{th} employment) and total annual payroll. Given employment reflects the employment level on March 12^{th}, there is some ambiguity on the timing of the merger in relation to the outcome of interest. For example, imagine two firms merge in June 2001. In the data, I will observe that the ownership switches for the target firm between 2000 and 2001. However, measured employment in 2001 will reflect March 12^{th} employment, and therefore will not reflect any impacts of the merger. A merger that occurs in January of 2001, however, will reflect impacts of the merger. Therefore, in the analysis, the effect at year zero should be interpreted as a partial effect of the merger, given not all of the M&A

[11] I thank Orley Ashenfelter for pointing out this example.

[12] Unlike many administrative datasets, the enterprise identifier in the LBD is not based on tax identifiers (e.g. EIN numbers in the U.S.). Tax identifiers do not necessarily reflect the level of highest control, because some firms operate with multiple identifiers Song et al. (2018).

[13] Another way to identify M&A activity is to use the Thomson One database of Mergers and Acquisitions. However, in this case, the databases need to be matched based on firm name and location information. A fuzzy name matching algorithm yields a match rate of about 60 percent. Chains and franchises complicate the matching given the location from the SDC is often the headquarters, while in reality, all same-name establishments should be matched. The matching is also particularly problematic in conglomerates with complicated corporate structures. For example, if a subsidiary of a conglomerate is sold, one might unintentionally attribute the entire conglomerate being sold if the parent firm and subsidiary share a similar name. For example, in 2015 General Electric sold many divisions of its subsidiary company General Electric Financial to a number of different companies.

establishments have actually been treated in this year. For further details on the LBD see Jarmin and Miranda (2002) and Haltiwanger et al. (2013).

3.2.2 Longitudinal Employer Household Dynamics (LEHD) Worker-Level Data

The worker-level data is drawn from the U.S. Census Bureau's Longitudinal-Employer Household Dynamics (LEHD) administrative files, which is used to construct quarterly workforce indicators (QWI) for local labor markets in the United States. The LEHD is constructed from state-level unemployment insurance files and includes worker-level information on quarterly earnings, employment, education, age, gender, and race, as well as information about the worker's firm, such as industry and location. While the LEHD partners with all 50 states, most projects are only approved for a subset of all states. This project utilizes data from 26 states (see Figure 1), which comprise about 53 percent of the total population in the United States as of the 2010 Census.[14]

The main outcome variable used in the worker-level results is log annual earnings which is aggregated across all employers. While earnings across all employers are included, I associate workers with the "dominant" employer (i.e. the employer for which the worker earns the highest amount of income). The firm-level variable in the LEHD is a State-Employer Identification Number (SEIN). A SEIN falls between an establishment and an enterprise identifier. Multi-unit enterprises may operate under multiple SEINs within a state, and a single SEIN may be associated with multiple establishments. In later results, I restrict the sample of workers to firm stayers, who are workers employed at the firm in the years following a merger. Given the firm-level variable in the LEHD is not necessarily invariant to ownership changes, I correct for false transitions in two ways. First, I use the entire sample of mergers identified in the LBD to correct for changing firm identifiers.[15] Next, I use worker flows between firms to capture reorganization events that are likely not true transitions, following Benedetto et al. (2007). For example, firms becoming incorporated may change tax identifiers. In practice, if more than 60 percent of the workers in a firm transition to the same firm in the next year, then I do not code any of these transitions as a job transition.

In later analyses, I construct average market-level earnings as the average earnings within in a commuting zone by industry cell after residualizing on worker observables (such as age, education, gender and race). Unlike the LBD, the location of the worker is sometimes ambiguous in the case of multi-unit enterprises. If an EIN owns only one establishment in a state, then the mapping from EIN to establishment is unique. For an EIN with multiple establishments in the same state, the assigned county of of the worker is the modal (employment-weighted) county. For example, if a given EIN employs 50 workers in Los Angeles, but 20 workers in San Francisco, then all of the workers in this EIN will be assigned to Los Angeles County in the LEHD.

I use the LBD to compute the true distribution of workers within an EIN across commuting zones. In the LEHD data, I then compute for every worker the probability the worker is employed

[14] The approved states are: AL, AZ, AR, CA, CO, DE, DC, HI, IL, IN, IA, KS, ME, MD, MO, MT, NV, NM, ND, OK, OR, PA, TN, TX, VA, WA.

[15] For each establishment in the LBD, I use the Standard Statistical Establishment List (SSEL) to retrieve the associated EIN, which I can then link to SEINs in the LEHD.

in their assigned commuting zone (which is simply the number of workers in the EIN employed in that commuting zone divided by the total number of workers in the state employed in that EIN). For many workers, this is equal to 100 percent. In computing a market-level wage, I only include the workers that have at least 95 percent chance of actually being employed in that commuting zone. For example, in the example above, I would not include information from the workers in the EIN with 50 workers in Los Angeles and 20 workers in San Francisco, as for these workers it is uncertain which workers are employed in which location. In practice, market-level wages with and without this restriction lead to nearly identical results.

3.3 Concentration Measurement

Relative to a standard HHI measure, the flows-adjusted concentrated measure (denoted C), requires computing transition rates across industries. A job in the LEHD is defined as any income earned at a given employer. For example, contractors that are hired by different firms will be coded as switching jobs (and in some cases, industries) very frequently. This will effectively increase the rate of cross-industry job mobility. Therefore, to compute transitions probabilities, I restrict to employment spells in which the worker is employed at the same firm for at least four quarters and require that annualized earnings exceed \$3,250, where these restrictions follow Sorkin (2018) who uses transitions in the LEHD to measure compensating differentials across firms. The intention of the earnings restriction is to drop workers with only weak attachment to the firm.

While, in theory, transition rates across industries may change, I instead choose to pool the entire sample (1995-2014) in order to retrieve a consistent and more precise measure of $_{m\to k}$ for every pair of industries m and k. To compute C in practice I make two modifications to the formula in Section 2.2.2. The model implicitly assumed there is one commuting zone and that firms only employed workers in a single industry. Allowing for multiple commuting zones and multi-industry firms changes the concentration measure slightly. In practice, I compute the share of firm j (denoted $\tilde{s}_{jmc}$) in industry m in commuting zone c as:

$$\tilde{s}_{jmc} = \frac{\sum_{k \in c} {}_{m\to k} l_{jkc}}{\sum_{k \in c} {}_{m\to k} L_{kc}} \tag{15}$$

where

$$_{m\to k} = \frac{P(k|m)}{P(m|m)} \frac{1}{\mathbb{E}[\frac{L_k}{L_m}]} \tag{16}$$

These are modified versions of Equations (12) and (10), respectively. First, the numerator of the market share is now a weighted total employment of firm j, indicating that firm j may hire workers in multiple industries. If jobs in industries m and k are relatively substitutable, then the market share of j in industry m will also depend on the number of workers employed in industry k. If firm j employs a large number of workers in market k, then this will increase firm j's total share of market m.

Second, the relative size term in $_{m\to k}$ (i.e. $\mathbb{E}[\frac{L_k}{L_m}]$) is now the expected relative size of industries

across commuting zones. To understand this factor, imagine there are two equally sized industries that use similar workers but are generally located in different areas. For example, imagine plastic manufacturing and rubber manufacturing plants hire similar workers, but plastic manufacturing primarily takes place in Texas while rubber manufacturing primarily takes place in Ohio. In this case, the aggregate relative size of the industries will be quite different than the expected relative size within a commuting zone given the two industries primarily operate in different commuting zones. Therefore, a low volume of flows between the two industries does not necessarily reflect low substitutability, but rather they are generally located in different areas.

The flows-adjusted local labor market concentration measure, C_{mc}, is defined as:

$$C_{mc} = \sum_{j \in c} (\tilde{s}_{jmc})^2 \tag{17}$$

One attractive feature of the C_{mc} measure is that it nests standard labor market definitions at the limits of worker mobility. If workers never transitions between industries, then C_{mc} is equal to an HHI index that uses an interaction between industry and commuting zone as the labor market definition. If workers transition randomly across industries, then C_{mc} is equal to an HHI index that uses commuting zone as the definition of a labor market.

Appendix C.2 shows this result algebraically. The proof can be seen by examining Equation (16). With no mobility across industries, $_{m \to k}$ will be zero for all industries $k \neq m$. Therefore Equation (15) will be equal to simple employment shares in the industry-by-commuting zone cell. With random mobility, flows across industries are determined by the relative size of the industries, with larger industries mechanically attracting more workers. In this case, $_{m \to k} = 1$ for all k and m, implying Equation (15) will be equal to simple employment shares in the commuting zone.

3.4 Matched Analysis Samples

I construct the M&A establishment-level analysis sample as follows. First, using enterprise-level identifiers I find every case in which the enterprise-level identifier changes for a given establishment to identify merger activity following past work (Maksimovic and Phillips, 2001; Tate and Yang, 2016; Atalay et al., 2019) between 1999 through 2009. In the LBD, firm identifiers also change when a single unit firm opens a new establishment and becomes a multi-unit firm. I immediately eliminate these cases as potential M&A events. Establishments belonging to the acquiring enterprise are defined as "acquiring" establishments, while those belonging to the sold firm are "target" establishments. In some cases, two firms switch to a new firm-level enterprise identifier, which can occur when two firms merge to join a completely new enterprise. In these relatively rare cases, I consider both firms target firms.

I begin with around 65,400 unique M&A events. In some cases, a firm will divest a portion or subset of all establishments to another enterprise. For example, in 2015, General Electric sold many divisions of GE Capital. I eliminate all "partial" mergers and acquisitions from the sample. This is done primarily because the worker-level data does not contain establishment-level identifiers.

Therefore, in some cases it would not be possible to determine who in GE was employed in the target establishments that were sold. This eliminates about 1,500 mergers.

Next, I require the establishment to have an employment level greater than 50 workers and positive employment between years $[t-4, t-1]$. This done to focus on economically active establishments with sufficient pre-period observations and eliminates a considerable number of small M&A events (50,000).[16] While there could be potentially large effects on target workers in these acquisitions, the focus of this paper is on potential anticompetitive effects by considering how impacts vary by changes in local concentration. Small mergers will mechanically have small impacts on concentration and may be very different than mergers between large firms of similar size.

Lastly, I restrict to mergers in which both firms are not too different in size. In particular, I require the target (or acquiring firm) to be at least 10 percent as large as the acquiring firm (or target firm). This is done so that the results are not dominated by extremely large acquiring firms that serial acquire smaller companies. This drops 6,800 events. In the end, these restrictions yield a final sample of 7,100 M&A events of relatively large and relatively stable firms.

I then match each establishment in the year prior to a M&A event to a "counterfactual" establishment in the same state and 4-digit NAICS industry as the M&A establishment. An establishment is a potential counterfactual establishment for firm j if: (1) the establishment is not part of a M&A event in year t, (2) the establishment has 50 or more employees in the year prior to the M&A event of the treated firm and positive employment in years $[t-4, t-1]$ and (3) the establishments are in the same size and average earnings decile in the year prior to the M&A event. Of all the possible counterfactual establishments for a given M&A establishment, I choose the establishment with the closest propensity score, where the propensity score is estimated by predicting treatment using a linear probability model with a quadratic in employment, a quadratic in payroll, a quadratic in establishment age, and an indicator for whether the firm is part of a multi-unit enterprise. This matching strategy is similar to a number of recent papers implementing a dynamic difference-in-differences research design (Jäger, 2016; Goldschmidt and Schmieder, 2017; Smith et al., 2019; Jaravel et al., 2018; He, 2018). The matching strategy finds a counterfactual establishment in about 64 percent of all cases.

Matching on size, earnings, state and industry finds establishments that would plausibly exhibit common trends in the absence of M&A activity. However, matching on industry and state is potentially problematic if mergers have impacts on local labor markets through increased concentration.[17] If M&A has negative impacts on firms in the same industry and state, then the impact of M&A on establishments will be biased towards zero. As discussed previously, these spillover effects are potentially important in estimating the total impact of M&A on workers and will be directly estimated in Section 6. Choosing one counterfactual per control group ensures that the treated and control groups are balanced on the matched variables.[18] I construct a balanced panel

[16] Note if a firm has multiple establishments, this restrictions drops establishments with less than 50 workers, but keeps establishments with more than 50 workers.

[17] In other words, the stable unit treatment value assumption (SUTVA) may be violated in this setting.

[18] An alternative to choosing one counterfactual is to choose all counterfactual establishments that meet the

of establishments which extends 4 years prior to the merger and 4 years after the merger. The main establishment level-outcomes are employment, which is equal to March 12^{th} employment.

To construct the worker-level sample, I extract all workers that were employed in the M&A firms in the two years prior to the M&A event. This tenure restriction is chosen to obtain a sample of workers with attachment to the M&A firm and is similar (though shorter) than tenure restrictions used in the mass layoff literature (Jacobson et al., 1993; Von Wachter et al., 2009; Lachowska et al., 2018). For each worker in the treated firms, I choose a worker in the same 4-digit NAICS industry, state, age bins (5 year bins), gender and firm size decile. I chose not to match workers based on earnings, given this is the endogenous outcome of interest, but results are of the same sign and significance for a matching procedure that matches explicitly on earnings. Again, if more than one match is found I choose the worker with the closest propensity score to the treated worker, where the propensity score is estimated by predicting treatment using a linear probability model with a quadratic in firm size, firm age, and worker age. In total, a counterfactual worker is found for about 72 percent of the treated M&A workers. To compute earnings in the worker-level data, I aggregate earnings across all employers if a worker is employed at more than one firm. As mentioned previously, the worker-level data only provides partial coverage of the U.S. Therefore, a number of M&A events occurring outside LEHD coverage are dropped from the worker-level analysis. To be included in the worker-level sample, I require both the target and acquiring firm to be present in the LEHD.

3.5 Summary Statistics

Figure 2 plots the number of workers employed in the M&A establishment sample over time on the left axis. The number of workers employed in the M&A sample establishments fluctuates widely over time, with a high of 1.5 million to a low of 0.5 million, with merger activity being somewhat procyclical. I also plot the number of M&A deals in the Thomson Reuters (SDC) database of Mergers & Acquisitions, a high-quality database that contains information on merger activity in the United States as well as characteristics of merger deals. As can be seen in Figure 2, the two time-series line up reasonably well. One important note, however, is that the M&A establishment sample from the LBD does make restrictions by eliminating small acquisitions and partial acquisitions and therefore is a subset of the total number of workers impacted by ownership changes. Ignoring these sample size restrictions and instead including all potential mergers, I find that about 2 percent of workers a year are employed in an establishment that changes ownership at some point over the year.

Panel A of Table 1 contains the summary statistics for M&A establishments and the matched control establishments. In total, there are about 46,000 treated M&A establishments belonging to 10,000 unique firms. The average annual payroll for M&A establishments is equal 11 million USD,

matching criterion, and then weight the data appropriately to balance the treated and control units. I chose to focus on one counterfactual as it simplifies weighting issues that occur when considering subsample splits, in which the weights would need to change across specifications.

while it is equal to 10.3 million USD for control establishments. The M&A establishments are slightly larger on average (250 vs. 240) and have similar earnings per worker (43.9 thousand USD vs. 42.8 thousand USD). About 32 percent of establishments are target establishments, implying acquiring firms in general own more establishments than target firms.

Panel B of Table 1 reports the industries of the M&A and control establishments. About 17 percent of all establishments are in the manufacturing sector. Other prominent sectors include health care (10 percent) accommodation and food (10 percent) and finance (9 percent). A key source of variation used to disentangle product market effects will be to compare effects in tradable vs. nontradable industries. I follow Berger et al. (2021) and Delgado et al. (2014) and define tradable goods as NAICS two-digit codes: 11, 21, 31, 32, 33, and 55. Codes 31-33 are manufacturing and make up the bulk of the tradable industries.[19] In total, about 24 percent of all M&A establishments are in a tradable industry.

Panel C of Table 1 reports characteristics of the M&A deal. In total, only 29 percent of establishments are in commuting zones in which the other firm involved in the merger owns at least one establishment. Because the local labor market concentration measure is measured at the commuting zone level, this implies that roughly 71 percent of establishments involved in mergers experience no change in local labor market concentration due to the merger. This will be an important source of variation when disentangling alternative channels. The average change in flows-adjusted labor market concentration due to the merger (including zeros) is about 1 percent. Conditional on some positive increase, the average impact is around 5 percent.

Table 2 includes information on the worker-level data. In total, there are about 2,000,000 workers in the sample. This is about 18 percent of what would be expected from the establishment-level counts of employment. The reason the worker-level sample is lower than expected is due to three reasons: (1) the LEHD covers only 26 states, and therefore a large number of mergers are dropped from the sample if either the target or acquiring firm is in one of the states without coverage and (2) the worker-level sample restricts to workers with two years tenure therefore dropping workers with short tenure and (3) workers without a valid matched control are dropped from the analysis (this occurs in 28 percent of cases).

On average, incumbent workers in the M&A firms earn about 55,170 USD per year, while control workers earn roughly 52,400 USD per year.[20] 46 percent of the workers are female. About 32 percent of M&A workers have a college degree while 31 percent of control workers have a college degree.[21]

[19] 11 is agriculture, forestry and fishing, 21 is mining, quarrying and oil and gas extraction, 31-33 are manufacturing and 55 is management of companies and enterprises.

[20] All earnings are adjusted to 2011 dollars.

[21] Education is imputed for a large portion of workers in the LEHD. This is done by linking the LEHD to the Decennial Census. State-specific logit models are then estimated to predict the education level. The variables included in these models are age categories, earnings categories and industry dummies.

4 Research Design

To estimate the impact of M&A on establishment-level or worker-level outcomes, I implement a matched difference-in-differences design by estimating a regression of the following form:

$$Y_{jt} = \sum_{k=-4}^{4} \left(\delta_k^{MA} \mathbb{1}(t_j = t^* + k) \times MA_j + \quad _j + \tau_t + u_{jt} \right) \tag{18}$$

where Y_{jt} is an outcome variable, MA_{jt} is an indicator for an M&A establishment, $\mathbb{1}(t_j = t^* + k)$ indicates an M&A event occurred k years in the past (or future) relative to the period of the M&A event t^*, $_j$ are establishment fixed effects, τ_t are year fixed effects that vary by the year of the M&A event and u_{jt} is an error term.[22]

To estimate worker-level impacts, I estimate a similar matched difference-in-difference design of the following form:

$$y_{it} = \sum_{k=-4}^{4} \left(\delta_k^{MA} \mathbb{1}(t_i = t^* + k) \times MA_i + \omega_i + \tau_t + u_{it} \right) \tag{19}$$

where y_{it} is an outcome variable for incumbent worker i in time t, ω_i are worker fixed effects, with all other variables being defined as in Equation (18). All standard errors are two-way clustered at the worker and 4-digit NAICS by commuting zone level.

A recent literature discusses a number of identification and interpretation issues that arise when using the timing of treatment to identify a treatment effect. By using a matched control group that is never treated, the specifications above do not suffer from the identification issues that arise in conventional event-study designs with never-treated units (Borusyak et al., 2021) or difference-in-differences designs with staggered timing (Goodman-Bacon, 2018). Identification here comes solely from differences in always-treated and never-treated units over time, not from units coming in and out of treatment.

4.1 Identifying Assumptions

The key identifying assumption is that outcomes for M&A establishments and workers would follow similar trajectories to control establishments and workers in the absence of a merger. This may be a strong assumption in this setting, as mergers are the result of endogenous decisions by firms. For example, acquiring firms may selectively target firms that will be profitable in the future. In this case, wages in the firm may grow even absent of the merger. Therefore, the estimate of the impact of M&A on earnings would be biased upwards. On the other hand, acquiring firms could target

[22] As shown in Schmieder et al. (2020), when workers must satisfy a tenure restriction to be included in the sample, it is common to observe a hump-shaped pattern in earnings, given individuals with a stable job are likely on a positive earnings trajectory. Controlling for years alone when pooling across multiple cohorts of treated and matched controls does not capture this hump-shaped pattern. This is why M&A event by year fixed effects are included in the estimation, which can control for this pattern of selection into the sample. This is equivalent to specification 4 in Appendix 2 of Schmieder et al. (2020).)

mismanaged businesses that are underperforming. If targets are chosen in such a way, we might expect employment and earnings to be falling in target firms before the merger. Therefore, the estimate could be downward biased if falling earnings at target firms would have been even greater in the absence of the merger.

A simple way to gauge the direction of the potential bias is to compare outcomes for M&A establishments and workers to the control establishments and workers in the years prior to the M&A event. For the worker-level results, I do not match on lagged earnings (the primary outcome), allowing for a transparent test of parallel trends, though strategies that do match explicitly on earnings yield results with similar sign and significance.[23]

However, while common trends is reassuring for a causal interpretation, shocks that occur contemporaneously with M&A events could still bias the results. For example, imagine a negative demand shock hits a commuting zone and causes both a decline in employment as well as an increase in merger activity as establishments are purchased before they go out of business. In this case, merger activity is correlated with shocks that decrease demand. Of course, the opposite could be true. In fact, in the aggregate, merger activity tends to be procyclical (Rhodes-Kropf and Viswanathan, 2004).

One way to alleviate this concern is to focus analysis on mergers that are less likely to have been triggered by local economic conditions of the establishment. To do so, I also consider the impact in mergers between national firms that operate in at least 5 commuting zones, the logic being that these changes in ownership are less likely to be driven by the local conditions of the establishment or workers.

5 Effect of M&A on Establishments and Incumbent Workers

5.1 Effect of M&A on Establishment-Level Employment

Panel A of Figure 3 plots $\hat{\delta}_k^{MA}$ from estimating Equation (18) with log employment as the outcome. As can be seen in the figure, the trends in log employment between M&A establishments and matched control establishments are similar in the years prior to the merger. As discussed previously, establishments are partially treated at time $k \neq 0$. In this year, log employment falls by -0.051. The year after the merger, the effect grows to -0.115 with a slight downward trend over time. The average impact in the four years after the merger is equal to -0.144 (SE=0.021), which corresponds to a 13.4 percent decline in employment. While employment declines have been documented in prior work Lichtenberg (1992), results are mixed depending on the particular setting. For example, Brown and Medoff (1988) find insignificant impacts on employment in a sample of mergers in Michigan. However, given the prior work on the impacts of M&A on layoffs, I next proceed to the analysis of incumbent worker outcomes. Appendix Table A2, Appendix Table A3 and Appendix Figure A5 show that the main effects are robust across a variety of deviations from the main

[23] This is the preferred wording describing qualitative results that have been approved by the Census disclosure review board but are based on quantitative results that have not gone through the full review process.

specifications.

5.2 Effect of M&A on Incumbent Worker Outcomes

Given the considerable turnover at M&A establishments, changes in average establishment earnings may reflect changes in worker composition. Therefore, I next turn to the worker-level data that allows me to control flexibly for composition by tracking the same workers over time.

In Panel of A Figure 4, I plot $\hat{\delta}_k$ from estimating Equation (19). As can be seen in the figure, earnings for M&A workers trend similarly to the control workers in the years prior to the merger, but fall gradually after the merger. The average effect in the 4 years after the merger is equal to -0.011 (SE=0.004). This decline could be due to M&A workers being displaced and moving to lower-paying firms or M&A firms reducing wages for their incumbent workers. While the large drop in employment at M&A establishments suggest large displacement effects, the reduction in employment could come primarily through decreased hiring, implying incumbent workers may be relatively unaffected.

To test for displacement effects, I consider the impact of M&A on the probability a worker transitions from a job. This transition could be to another firm in the LEHD, to a firm outside the LEHD coverage, or to non-employment. In practice, I cannot discern between a transition to a firm outside the LEHD coverage or non-employment. Panel B of Figure 4 plots the estimates of Equation (19) with an indicator for a job transition as the outcome. The year after the merger, job transitions spike, with M&A workers 10 percentage points more likely to switch jobs relative to control workers. Therefore, the roughly 13 percentage point drop in employment can be attributed mostly to increased job separations for incumbent workers. Given this large increase in job separations, part of the effect on earnings may be coming from job displacement rather than within-firm decreases in earnings.

To study the impacts solely due to within-firm changes in compensation, Panel C of Figure 4 restricts the analysis to firm stayers, who are workers that stay in the same firm in the years following the merger. I make this restriction for both M&A workers and control workers so that the treatment group does not mechanically contain workers that have more stable job histories. Log annual earnings for firm stayers in M&A firms decrease by -0.008 (SE=0.003) in the years following the merger. Interestingly, this effect is not significantly different than the -0.011 decrease for all workers, a seemingly contradictory finding to the large losses commonly documented in the mass layoff literature. One potential explanation is that the mass layoffs studied in the prior literature may be more common in years or industries with declining demand, for which it may be difficult for workers to find a suitable alternative job. Workers in M&A firms may be better situated to find equally well-paying jobs quickly.[24]

[24] He (2018) finds similar results for firm stayers and firm leavers in Denmark.

5.3 Potential Mechanisms and Heterogeneity

5.3.1 The Role of Local Labor Market Concentration

Declining employment and earnings at M&A firms can be rationalized through changes in production technology, changes in product market power, or changes in monopsony power. I now use variation across mergers to disentangle these channels. The focus here is to understand how compensation policies within M&A firms change after the merger. Therefore, I report estimates for firm stayers that do not reflect any displacement effects.

I explore heterogeneity in three key dimensions: the predicted size of the change in concentration, the initial concentration level, and whether the firm is in a tradable industry. First, mergers below the top-quartile (ordered by predicted changes in concentration) have roughly zero impact on local labor market concentration (most of these are between firms operating in different commuting zones). Predicted impact on concentration is computed by taking employment levels in the year prior to merger and computing the impact on concentration by merging the two entities. Therefore, predicted impacts do not reflect any endogenous changes of the merger itself, as they are computed before the merger has taken place.

I refer to these mergers that have negligible predicted impacts on local labor market concentration as "low-impact" mergers. Of course, there could still be large effects in these mergers in principle. New management practices could increase wages through productivity increases. "Low-impact" here refers to the fact that the merger has low predicted impact on local labor market concentration.

Following the model in Section 2.2.2, concentration changes should have larger impacts on wages in already concentrated markets. Therefore, I split top quartile mergers into two separate groups: mergers that occur in markets with below-median concentration markets are referred to as "medium-impact" mergers while mergers that occur in above-median level of concentration are referred to as "high-impact" mergers. Lastly, in many industries increases in local concentration are likely to increase both product and labor market power. To isolate labor market power, I also present results for tradable industries only. The logic for restricting to tradables is that prices for goods sold on a national or international market are less likely to be impacted by a single merger.

In Panel A of Figure 5, I find low-impact mergers result in an insignificant -0.005 (SE=0.004) decline in log annual earnings for incumbent M&A workers. In medium-impact mergers log annual earnings fall by -0.008 (SE=0.007). In contrast, in high-impact mergers, log annual earnings fall by -0.031 (SE=0.011). Columns 4-5 of Table 4 show that the differences between high-impact mergers and the other types of mergers are statistically significant.

These results support two main conclusions. First, mergers that only impact productivity (i.e. low-impact mergers) there is almost no change in earnings. Firms often argue that mergers with potentially anticompetitive impacts should be allowed based on intended productivity gains. If these gains are realized, it does not appear that they spillover to workers. Second, the results are consistent with both market power or monopsony power resulting in lower wages for workers. There

are negative impacts in mergers that increase concentration, with almost the entire impact being driven by mergers in already concentrated markets.

To isolate monopsony power, Panel B of Table 4 reports results for tradable goods industries, for which I assume there is no impact of a merger on product market power. In high-impact mergers, I continue to find an economically meaningful decline in log annual earnings of -0.067 (SE=0.023). In medium-impact mergers, I find a slight positive rise in log earnings of 0.001 (SE=0.012), while in low-impact mergers I find a marginally significant decline of -0.012 (SE=0.006). Columns 4-5 of Table 4 shows that the differences between high-impact mergers and other types of mergers are statistically significant.

5.3.2 Robustness of Wage Losses Only in High-Impact Mergers

One potential concern is that mergers that are predicted to increase concentration in already concentrated markets are different in some unobservable way than mergers that do not increase concentration or mergers in unconcentrated markets. For example, imagine a negative demand shocks hits a commuting zone and many firms go out of business, resulting in an increase in local labor market concentration that pushes this labor market into the above-median concentration group. Additionally, imagine some low-productivity target firms are sold to high-productivity acquiring firms in the same area before they go out of business. In this case, high-impact mergers would be correlated with negative demand shocks.

To alleviate this concern, I also explore heterogeneity in a sample of national mergers between firms that operate in multiple commuting zones. In these mergers, the motive for the merger is unlikely to be driven by local economic conditions that are correlated with high-impact mergers. I find a very similar pattern of heterogeneity in these results. In Panel C of Table 4, I find low-impact mergers cause an insignificant -0.008 decline in log annual earnings, medium-impact mergers cause a marginally significant -0.013 decline in log annual earnings, and high-impact mergers cause a -0.042 decline in log annual earnings, an effect significant at the 1 percent level.

A related concern is that mergers that increase concentration tend to be between firms that are much larger on average. Panel B of Appendix Table A4 estimates the effect on firms with above-median level of employment to ensure the effects are not driven by low-impact mergers also being driven by the smallest firms. Here I continue to find a similar pattern of heterogeneity across low-impact, medium-impact and high-impact mergers.

Turning to isolating labor market power, one concern is that there could be an effect on prices in tradable industries if the industry is very concentrated. Therefore, I would be misinterpreting the finding that the differential impact on earnings in high-impact mergers in tradables is driven by increased monopsony power. In Panel A of Appendix Table A4, I estimate the impact in mergers in tradable industries with a product market national HHI less than 0.05 (for comparison, the Horizontal Merger guidelines consider an HHI of 0.15 to be moderately concentrated) and continue to find very similar results.

Lastly, as discussed in Section 3, for multi-unit firms it is sometimes ambiguous which commut-

ing zone a worker is actually employed in within a state, therefore, I could be misclassifying some workers leading to measurement error. In Panel C of Appendix Table A4 I restrict to workers in which the location of employment is known with certainty and continue to find similar results.

To summarize, concentration plays a key role in explaining heterogeneity impacts of M&A on workers' earnings. Impacts are consistently largest in mergers that are predicted to increase concentration in already concentrated markets. This is true in industries with highly tradable goods as well as when restricting to national mergers for which the local economic conditions likely did not trigger the M&A event.

However, the worker-level analysis has a few limitation. First, while I have provided evidence that is consistent with concentration being a contributing factor, there are other stories that could potentially rationalize the data. If productivity effects are negative and correlated with concentration, then this could also rationalize the findings. Additionally, hostile takeovers could result in breach of trust (Shleifer and Summers, 1988), as documented in He (2018). If this breach of trust channel is correlated with concentration, then this would also predict the largest wage losses in high-impact mergers.

Ignoring potential endogeneity concerns, the worker-level results also likely understate the impact of mergers on workers for due to potential spillovers on non-merging firms hiring in the same labor market. Imperfect competition in the labor market implies wages will fall for all firms in the market, not just for the merging firms.

To address these limitations, I next proceed to the market-level analysis. The market-level results are complementary to the worker-level evidence by focusing on other firms competing in the same labor market. Therefore, changes in wages at merging firms due to the reorganization, such as productivity or breach of trust in contracts, will not be able to explain market-level declines in wages. Additionally, by focusing on other firms we can discern the total impacts of M&A events on the broader labor market. Lastly, these market-level results link the results directly to a recent literature that interprets negative correlations between local labor market concentration and market wages as evidence of imperfect competition in labor markets. Before proceeding to the main analysis, I first discuss why these correlations may be potentially misleading in practice.

6 Market-Level Impacts of Increased Concentration

6.1 Overview

In the first part of this section, I make two main points that suggest caution in using correlations between local concentration and earnings to make inference about how changes in market structure impact workers. First, while increases in local concentration within a market are correlated with declining earnings, they are also correlated with *increases* in employment. This positive correlation with concentration and employment is inconsistent with concentration changes increasing monopsony power. Second, most variation in concentration within a market is *not* driven by merger activity, but other factors such as entry or exit.

In the second part I use variation in concentration due to merger activity as an instrument for local market concentration. This estimates the impact of *merger-induced* changes in concentration on labor market outcomes. I argue this variation identifies a well-defined and theoretically relevant elasticity of earnings with respect to local labor market concentration.

6.2 Correlates of Concentration Changes

To understand how changes in concentration relate to real-world outcomes, I regress changes in labor market concentration on changes in market-level employment and earnings:

$$\Delta Y_{mt} = \quad \Delta \tilde{C}_{mt} + \tau_t + u_{mt} \tag{20}$$

where Y_{mt} is a market-level outcome, $\Delta \tilde{C}_{m,t}$ is the change in log of the flows-adjusted labor market concentration, and τ_t are year fixed effects. The regression is weighted by employment and standard errors are clustered at the market level.

To construct the average log market-level earnings in the LEHD ($\tilde{w}_{mt}$), I first estimate a Mincer-style regression of the following form at the worker level:

$$\tilde{w}_{it} = \Phi_{mt} + \quad {}_t X_{it} + u_{it} \tag{21}$$

where $\tilde{w}_{it}$ is the log annual earnings of worker i at time t, Φ_{mt} are labor-market fixed effects (i.e. 4-digit NAICS by commuting zone cells), and X_{it} contains worker-level observables including a polynomial in age, race, gender and education.[25] This regression is estimated every year (hence ${}_t$) so that returns to characteristics can vary across years. The average market wage ($\tilde{w}_{mt}$) is equal to the fixed effect $\hat{\Phi}_{mt}$. As discussed in Section 3, for workers in EINs that employ workers in multiple commuting zones within a state, it is sometimes not possible to determine the commuting zone of employment for a given worker. In practice, I restrict to workers that have at least a 95 percent probability of actually working in the listed commuting zone (See Section 3 for more details), which is computed using the true distribution of workers across commuting zones in the LBD. However, the premiums with and without this restriction are similar and do not impact the market-level results.

Column 1 of Table 5 finds an elasticity of earnings with respect to the flows-adjusted concentration measure equal to -0.099 (SE=0.005), similar to results found in prior work (Azar et al., 2020; Benmelech et al., 2020; Rinz, 2020). Using a more standard HHI based on 4-digit NAICS by commuting zone yields very similar results (-0.085). These results are consistent with increased local labor market concentration resulting in higher monopsony power which leads to lower wages for workers.

[25] Education is imputed for about 80 percent of workers in the LEHD. The imputation procedure is performed by the Census and is done by linking the LEHD to the Decennial Census. State-specific logit models are then estimated to predict the education levels for all workers with missing education using the following set of observables: age categories, earnings categories, and industry dummies.

However, column 3 of Table 5 displays the results with log market-level employment as the outcome. In stark contrast to the earnings results, I find that increases in concentration are correlated with *increases* in market size. The elasticity of employment with respect to C is equal to 0.31 (SE=0.010). The fact that market size increases with concentration is inconsistent with concentration increasing monopsony power. Additionally, in Table 6, I decompose changes in concentration into various sources, including mergers, exit, entry, and reallocation of employment across firms. I find only about 1.4 percent of the variation in concentration over time is due to merger activity.

Given these facts, it is not clear whether approaches that estimate the elasticity of earnings with respect to local concentration using any change in concentration are useful for understanding how changing market structure impacts workers. In the next section, I estimate the elasticity of earnings with respect to *merger-induced* changes in local concentration, which is both theoretically justified as well as directly relevant to antitrust authorities.

6.3 Market-Level Merger Sample

In this section, I identify the impact of local concentration on market-level earnings by comparing the evolution of average market earnings and employment for markets that experience smaller predicted merger-induced concentration changes to markets that experience larger predicted merger-induced concentration increases. Therefore, while merger activity may itself be endogenous, the identification strategy conditions on a market experiencing some merger activity, with the identifying variation coming from differences in the size of the concentration changes across markets.

To construct the market-level sample, I follow a similar procedure as the establishment and worker-level sample. For each year t, I compute the predicted change in log market concentration in every market m due to merger activity, denoted $\tilde{C}_{mt}^{MA}$. I define a concentration event as a change in concentration of at least one percent.[26] For each concentration event I construct a 4-year window around the event, just as in the worker and establishment-level results. For 92.5 percent of markets, there is only one event during the sample period. For markets that experience multiple events, I follow Lafortune et al. (2018) and create duplicate observations, one duplicate associated with each event year. Approaches utilizing only the first event, the largest event, or dropping all multiple event markets yield results with the same sign and significance.

An alternative to this approach is to allow exposure to merger-induced concentration to accumulate over time within a market. I prefer to use the specification that breaks labor markets that experience multiple events into different observations with different corresponding event years because this provides a transparent way to validate the identification strategy by comparing outcomes before and after the concentration event. In total, I identify roughly 3500 merger-induced

[26] The reason positive changes below 0.01 are not considered "concentration events" is due to how the flows-adjusted concentration measure C is constructed. Because the concentration in market m depends on all industries m is connected to by labor mobility, a single merger affects many markets. Most of the changes though are very small. Therefore, using any positive change leads to an extremely large number of markets being impacted by merger activity, but the overwhelming majority of these increases are nearly zero.

concentration events in the LEHD data.

6.4 Do Earnings Decrease in Markets with Larger Increases in Concentration?

To begin, I first test whether larger increases in concentration are associated with larger declines in market earnings. To allow for the effect to depend flexibly on the size of the concentration change, I fit an interacted difference-in-differences model of the following form:

$$\tilde{w}_{mt} = Post_{mt} \times \left[\sum_{b=1}^{4} s_b(\tilde{C}_m^{MA}) \right] + \Phi_m + \tau_{t,k(m)} + u_{mt} \tag{22}$$

where $\tilde{w}_{mt}$ is the average log market wage obtained by first residualizing on worker observables, as described in Section 6.2. To focus on spillovers and net out any direct impacts on the merging firms, I omit the merging firms when constructing the average market wage for the primary results. Φ_m are labor-market fixed effects (i.e. 4-digit NAICS interacted with commuting zone), $\tau_{t,k(m)}$ are year fixed effects that potentially vary by some observable of the labor market m. The preferred specification interacts year fixed effects with consolidation year and 1-digit NAICS by state cells. Therefore, the impact of concentration on earnings is identified from two merger-induced concentration changes that occur in the same year, within the same state, same 1-digit industry, but have different magnitudes of predicted changes in the flows-adjusted concentration measure $\tilde{C}_m^{MA}$. To make the results comparable to the worker and establishment-level results, most specifications weight by employment in the period prior to the concentration increase, though I also present unweighted results.

The function $\{s_b(.)\}_{b=1}^4$ is a set of basis functions defining a natural cubic spline with four knots. Following Harrell (2001), I place the knots at the 5^{th}, 35^{th}, 65^{th}, and 95^{th} percentiles of the distribution of concentration changes.[27] The "dose-response" function $d(x) = \sum_{b=1}^4 s_b(x)$ gives the effect of a predicted concentration change equal to $x\psi$on the market-level wage. This specification can be interpreted as a nonlinear reduced form in which $\tilde{C}_m^{MA}$ is the instrument for actual concentration. The specification is similar to Kline et al. (2019) who use patents as an instrument for firm surplus.

Figure 6 plots the dose-response function over a grid of values of $\tilde{C}$. As can be seen in the figure, at low values of predicted concentration changes, there is no impact on market-level wages. At predicted concentration changes above 0.21, there are negative impacts that increase in absolute value as the concentration changes grow larger. The value of 0.21 corresponds to roughly the 95^{th} percentile of all predicted concentration changes. This implies only the top ventile of predicted concentration increases generate significant shifts in market-level wages.

[27] As per Census restrictions, percentiles cannot be reported. Instead I report psuedo-percentiles, which correspond to the averages of the percentiles around the knot. For example, the psuedo-95^th percentile is the average of the 94^{th}, 95^{th} and 96^{th} percentile. The pseudo-knots are equal to 0.011, 0.018, 0.037, 0.21. The spline is restricted to be linear below the 5^{th} and above the 95^{th} percentile.

6.5 Market-Level Difference-in-Differences Estimates

The fact that larger predicted changes in concentration generate larger shifts in outcomes could partially reflect different pretrends between markets that experience large vs. small predicted changes in local labor market concentration. Motivated by the analysis in the last section, I compare outcomes for predicted concentration changes in the top-ventile vs. all other predicted concentration changes. Appendix Table A5 presents summary statistics that compares these markets. On average, top-ventile predicted concentration increases are more likely to occur in manufacturing industries and southern states, but the markets themselves are composed of workers with similar education, similar age, and similar gender composition.

First, I test whether mergers actually create persistent increases in local labor market concentration. As discussed earlier, concentration changes are not primarily driven by ownership changes. Therefore, even if a merger has a relatively large predicted impact on concentration, the impact may be transitory of variation over time is dominated by other factors. Additionally, if mergers incentivize more entry (for example, if the merged firm raises price, then more firms may enter), then increases in concentration may be transitory. To estimate the dynamic impacts of mergers on concentration, I estimate a dynamic difference-in-differences specification of the following form:

$$C_{mt} = \sum_{k=-4}^{4} \delta_k^C \mathbb{1}(t_m = t^* + k) \times Q20_m + \Phi_m + \tau_{t,k(m)} + u_{mt} \tag{23}$$

where $Q20_m$ indicates the market is involved in a predicted concentration change in the top ventile of all concentration changes. Panel A of Figure 7 plots the coefficients $\hat{\delta}_k^C$ from estimating Equation (23). In the year after the merger, concentration jumps significantly in $Q20_m$ markets (18 percent), an effect that remains flat over time. This shows that mergers can generate significant increases in market concentration that persist over time. In other words, there is a strong first stage using top-ventile mergers as an instrument for local labor market concentration.

Next I turn to the impact on market earnings by estimating Equation (23) with the average market-level earnings $\tilde{w}_{mt}$ as the outcome. Panel C of Figure 7 plots the results. On average, log averge earnings in the top ventile markets fall by -0.034 (SE $= 0.013$) after the concentration event.

6.5.1 Elasticity of Earnings with Respect to Local Labor Market Concentration

Finally, I estimate the elasticity of earnings with respect to concentration in a two-stage least squares regression of the following form:

$$\tilde{C}_{mt} = \Phi_m + \tau_{t,k(m)} + Q20_m \times Post_{mt} + u_{mt} \tag{24}$$

$$\tilde{w}_{mt} = \Phi_m + \tau_{t,k(m)} + \quad \tilde{C}_{mt} + u_{mt} \tag{25}$$

where Equation (24) is the first-stage regression with an indicator for a top-ventile change interacted with post-merger indicator as the excluded instrument. In Column 1 of Table 7, I find top-ventile changes increase log concentration by 0.175 with a corresponding F-statistic equal to 16. In Column 1 of Table 8, I find the elasticity of earnings with respect to concentration is equal to -0.22 (SE=0.094).

As in the worker results, I find that this effect is driven entirely by markets with above the median level of concentration. In Column 4 of Table 8, I find the elasticity of earnings with respect to concentration is equal to -0.259 (SE=0.108) in above-median concentration markets. However, the elasticity is 0.059 (SE=0.121) in below-median concentration markets. Therefore, consistent with the theoretical model as well as the Horizontal Merger guidelines, increases in concentration have no impact on earnings in low-concentration markets, but relatively large effects in high-concentration markets.

While the common trends in the event-studies corroborate the causal interpretation of these results, merger activity is not random across markets. Variation in concentration changes across markets could be correlated with the economic conditions of the particular location or industry. Therefore, to isolate variation that is not driven by local economic conditions, Appendix Table A6 utilizes variation in concentration driven by mergers between national firms that operate in multiple commuting zones. This specification yields an estimate for the elasticity of earnings with respect to concentration of -0.262 (SE=0.128).[28]

These results show that increased concentration due to merger activity results in earnings declines. However, as discussed previously, increases in local labor market concentration may increase *both* labor market power and product market power. In Column 4 of Appendix Table A6, I find the elasticity of concentration is equal to -0.331 (SE=0.180) in tradable industries for which product market effects are likely ameliorated. Interestingly, elasticity is larger in tradable industries is consistent with the worker-level results, though the confidence intervals here are quite large, making the difference in elasticities between tradable and nontradable markets not statistically significant.

To summarize, I find the majority of mergers do not cause market-level spillovers, because, on average, mergers do not cause very large increases in market concentration. However, the largest mergers (top-ventile), do cause market-level declines in earnings that are not due solely to changes at merging firms or product market effects, making increases in labor market monopsony of potential interest to antitrust authorities. In the next section, I interpret the estimates in this section through the lens of the Cournot model discussed in Section 2.2.2.

6.6 Model-Based Interpretation

To interpret the magnitudes of these results, I perform two exercises. First, I use the Cournot model of competition to compute implied wage markdowns over time. This allows me to compute

[28] In Columns 2-3, I vary the definition of multi-region firm by requiring the acquiring and target firms to operate in at least five (Column 2) or ten (Column 3) commuting zones and continue to find similar results.

how much local labor market concentration depresses wages and to discuss how changes in the distribution of local concentration relate to important labor market trends such as the falling labor share and stagnant wage growth. Second, I estimate how many mergers would be blocked according to different threshold rules that antitrust authorities might adopt. This analysis informs the scope of antitrust scrutiny in the labor market and whether this has changed over time.

6.6.1 Wage Markdowns over Time

To begin, I first compute the fraction of the marginal revenue product of labor that accrues to the worker. Recall from the model that this fraction is given by:

$$_m = \frac{\eta_m}{C_m + \eta_m} \tag{26}$$

where η_m the market-level elasticity of labor supply. I denote implied wage markdown as $1 - \frac{\eta_m}{C_m + \eta_m}$. For now I will assume the market-specific parameter (η_m) is constant across markets and will denote it by η. This is certainly violated in practice, but serves as a natural benchmark. If η and C are positively correlated, then I will overstate monopsony power. This is because markets that are highly concentrated will also have elastic labor supply, implying the high concentration has a smaller impact on wages. If the two are negatively correlated then I will understate monopsony power. Assuming η is constant, then the change in the log wage in a market due to a merger that shifts concentration from C_1 to C_2 is given by:

$$\Delta \tilde{w} = \Delta\tilde{\theta} + ln\left(\frac{\eta}{C_1 + \eta}\right) - ln\left(\frac{\eta}{C_2 + \eta}\right) \tag{27}$$

Where $\Delta\tilde{\theta}$ is the change in average marginal revenue product in the market. Therefore, for a given η, initial concentration C_1, and post-merger concentration C_2, it is straightforward to estimate the implied change in the log market wage (assuming the change in average marginal revenue product is known). To estimate η in practice, I choose the value that minimizes the distance between the model-implied impact of a top-ventile merger $m(\eta)$ on market wages and the estimated impact $\hat{} = -0.034$ found in Section 6.5.

That is, I set:

$$\hat{\eta} = \arg\min_{\eta} (\hat{} - m(\eta))^2 \tag{28}$$

Because $m(\eta)$ in general depends on the differential effect of the merger on market-level $\tilde{\theta}$, I assume for tractability that the change in $\tilde{\theta}$ is the same for top-ventile mergers and all other mergers. This implies that $m(\eta)$ now only depends on changes in market concentration between mergers and the elasticity of labor supply.

This procedure yields an average labor market supply elasticity equal to $\hat{\eta} = 0.87$ (SE=0.44), which falls between aggregate and firm-specific (often referred to as residual) labor supply elastici-

ties common in the literature.[29] With the estimated $\hat{\eta}$ it is straightforward to compute the implied wage markdown due to concentration by plugging in $\hat{\eta}$ for every market and then computing the employment-weighted average across all markets. Figure 8 plots these results over time. As can be seen in the figure, the implied markdown begins around 5 percent in 1988, implying local concentration reduces earnings by 5 percent relative to a setting in which concentration is approximately zero. This markdown has been trending downwards over time, falling slightly below 4 percent in 2014. If one instead used a standard HHI measure that assumed a labor market is given by a 4-digit NAICS by commuting zone cell, then the implied wage markdown would be about 11.4 percent. The difference here is completely mechanical due to the HHI measure resulting in strictly more concentrated markets.

This analysis leads to two important points. First, I find markdowns that are quite a bit lower than many papers estimating firm-specific labor supply elasticities (Hirsch et al., 2010; Ransom and Sims, 2010; Staiger et al., 2010; Manning, 2011; Depew and Sørensen, 2013; Hirsch et al., 2010; Webber, 2015; Cho, 2018; Dube et al., Forthcoming; Kline et al., 2019), with markdowns anywhere between 25 to 90 percent. However, monopsony power can stem from many sources. For example, search costs and workplace differentiation will lead to monopsony power even when firms are atomistic (Bhaskar, Manning and To, 2002; Manning, 2003; Card, Cardoso, Heining and Kline, 2018; Lamadon, Mogstad and Setzler, 2019). In contrast to prior papers, I identify this markdown from concentration changes only. Therefore, it should not be interpreted as reflecting all possible sources of monopsony power.

Second, while increased monopsony power has been suggested as playing a role in the declining labor share and stagnant wage growth, local labor market concentration does not appear to be the culprit. If anything, markdowns due to local concentration have been trending downward since the late 1980s. However, these results do not necessarily imply that monopsony power in general has been decreasing over time. As discussed above, local concentration is only one source of monopsony power. Declining unionization rates (Farber et al., 2018) or increases in non-competes and no-poaching agreements (Krueger and Ashenfelter, 2018; Krueger and Posner, 2018) could lead to rising monopsony power even in the presence of falling local concentration.

6.6.2 The Scope of Antitrust Scrutiny

In this final section, I consider the fractions of mergers that would be blocked by a hypothetical antitrust authority that blocked any merger that was predicted to decrease wages by a given amount. To compute the predicted impact of a given merger on the market wage I simply compute Equation (27) for every merger in the data. Note that many mergers increase concentration in multiple markets, and therefore I consider a merger blocked if it lowers wages by a given amount in at least one market. To be clear, in practice, this procedure could lead to misleading results for

[29] For example, a number of papers find aggregate elasticities between 0.15 and 0.5 (See Table 2 of Chetty (2012)). Firm-specific elasticities vary depending on the setting and industry, but a number or recent papers have found elasticities between 1 to 5 (See Manning (2011) for a review).

any given merger. The market-level elasticity of labor supply will certainly vary across markets, while this exercise assumes it is constant. However, the goal for this exercise is not to predict the change for a given merger, but rather get a sense of roughy how many mergers would be blocked based on different thresholds.

Figure 9 plots the fraction of mergers that would be blocked over time for a 1 percent decline in the wage (solid blue line) and a 5 percent decline in the wage (dashed orange line). As can be seen in the Figure, for a 1 percent decline in the wage, the percent blocked fluctuates between 2 to 8 percent a year, with an average equal to 4.6 percent of all mergers blocked. For a 5 percent decline, about 1.2 percent of all mergers would be blocked. In product markets, a 5 percent increase in product prices is considered large enough to warrant antitrust scrutiny. Over these years, the DOJ and FTC issued enforcement challenges in about 1.9 percent of all merger notifications (See Appendix Figure A2). While these numbers are close in magnitude, they are not directly comparable (both are subsets of all merger activity). Additionally, of the 1.9 percent that are challenged, many are modified while some are abandoned or blocked. Essentially, the 1.2 percent is the percent of *completed* mergers that would have been blocked by a hypothetical antitrust authority, not the percent of *proposed* mergers that would have been blocked.

This simple exercise leads to two conclusions. First, I interpret this as evidence that the labor market is an important market for which antitrust scrutiny is relevant, but likely only for very large mergers that generate considerable shifts in local concentration, similar to how antitrust is enforced for product markets. Second, it seems unlikely that lack of antitrust scrutiny in labor markets led to stagnant wage growth or falling labor share over time. There is no clear trend in the number of hypothetically blocked mergers over time and local concentration has actually been falling over this time period.

7 Conclusion

Labor market power poses a serious threat to workers. However, a merger has never been subjected to antitrust scrutiny due to potential harm in the labor market. Despite a recent call-to-action by both academics and policymakers, there is limited empirical evidence and little guidance on how to perform antitrust analysis in labor markets.

In this paper, I document the impacts of M&A on workers utilizing a matched employer-employee dataset for the United States. To link this evidence to monopsony power, I examine heterogeneity in impacts driven by differences in changes in local labor market concentration across mergers. Predicting anticompetitive effects from changes in concentration has a long history in antitrust, but is often criticized for relying on potentially arbitrary market definitions. I construct a measure of concentration that directly takes into account substitutability across industries by utilizing data on job-to-job flows.

I find that mergers with small impacts in local labor market concentration do not have significant impacts on workers' earnings. However, mergers that generate large shifts in concentration have

economically meaningful and statistically significant effects. These effects are larger in already concentrated markets, are consistent in tradable industries, and are consistent in a sample of national mergers that are likely not driven by local economic conditions. Additionally, I find evidence of spillovers in the labor market, with other firms in the labor market decreasing wages in response to merger activity. I argue that this evidence justifies antitrust authorities scrutinizing mergers on the basis of increased labor market power.

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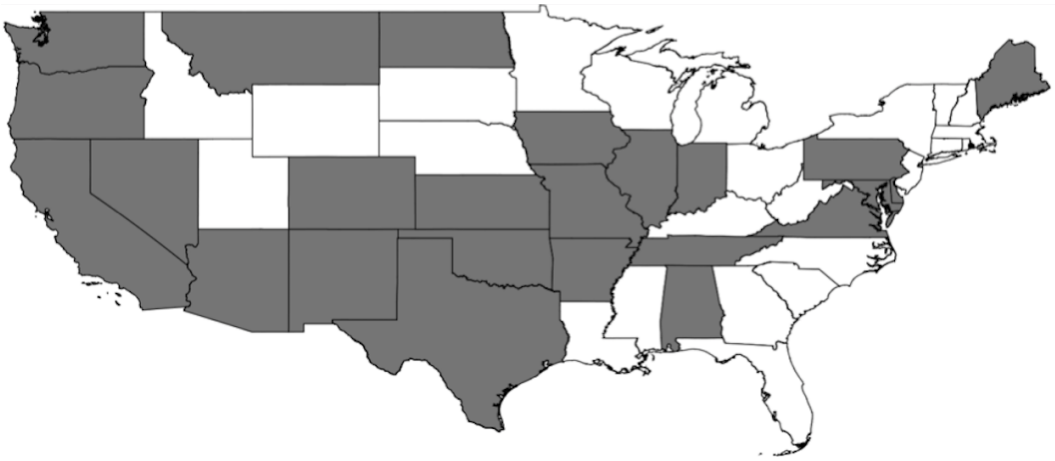
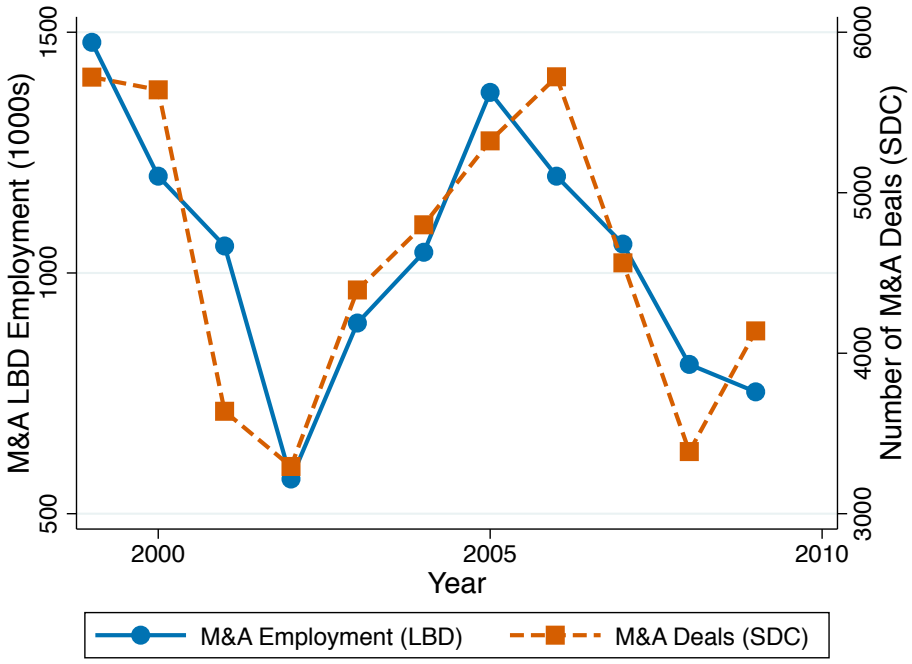
Figure 1: Sample of States with Worker-Level (LEHD) Data Available



Note: The states with worker-level (LEHD) data available are shaded in gray. The sample includes: AL, AZ, AR, CA, CO, DE, DC, HI, IL, IN, IA, KS, ME, MD, MO, MT, NV, NM, ND, OK, OR, PA, TN, TX, VA, WA. These states correspond to 53.8 percent of the U.S. population as of the 2010 U.S. Census.

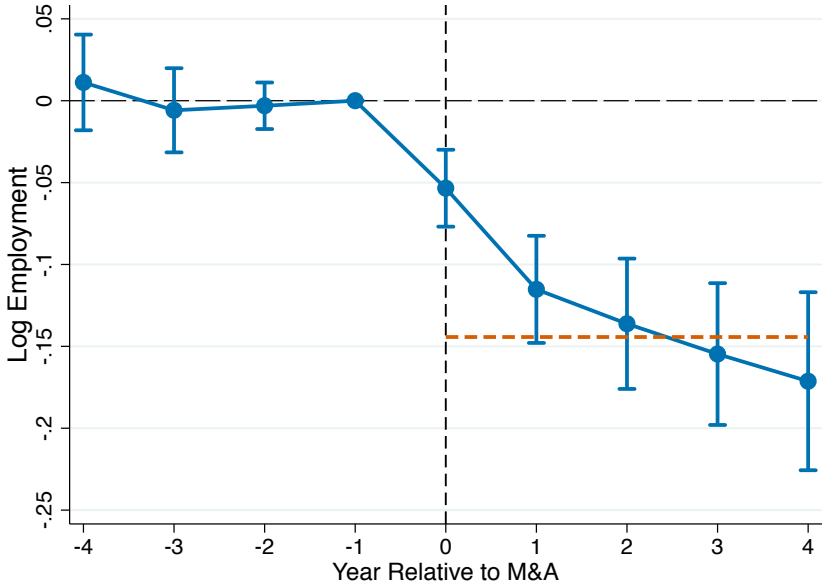
Figure 2: M&A Activity over Time



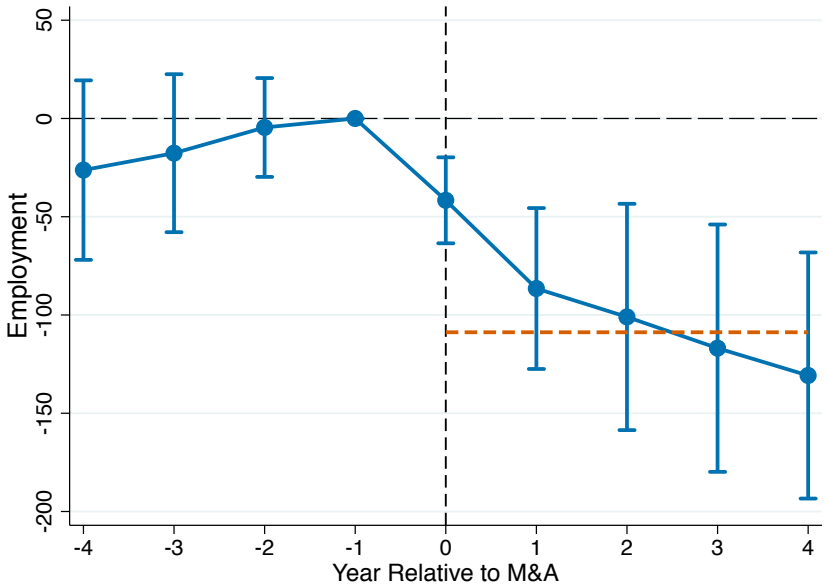
Note: This figure plots the total employment in M&A establishments (solid blue line) over time. This sample is a subset of all merger activity due to sample restrictions that drop small and partial M&As. For more details on sample construction see Section 3.4. The dashed orange line plots the number of deals completed in the Thomson Reuters Database of Mergers & Acquisitions (SDC). To compute the total number of deals, I drop leveraged buyouts, divestitures, deals that are never completed, and deals in which the acquiring firm acquired less than 100 percent of the target firm. However, I make no restrictions on firm size given employment is often missing in the SDC database.

Figure 3: Difference-in-Differences Estimates of the Effect of M&A on Employment

Panel A: Log Employment

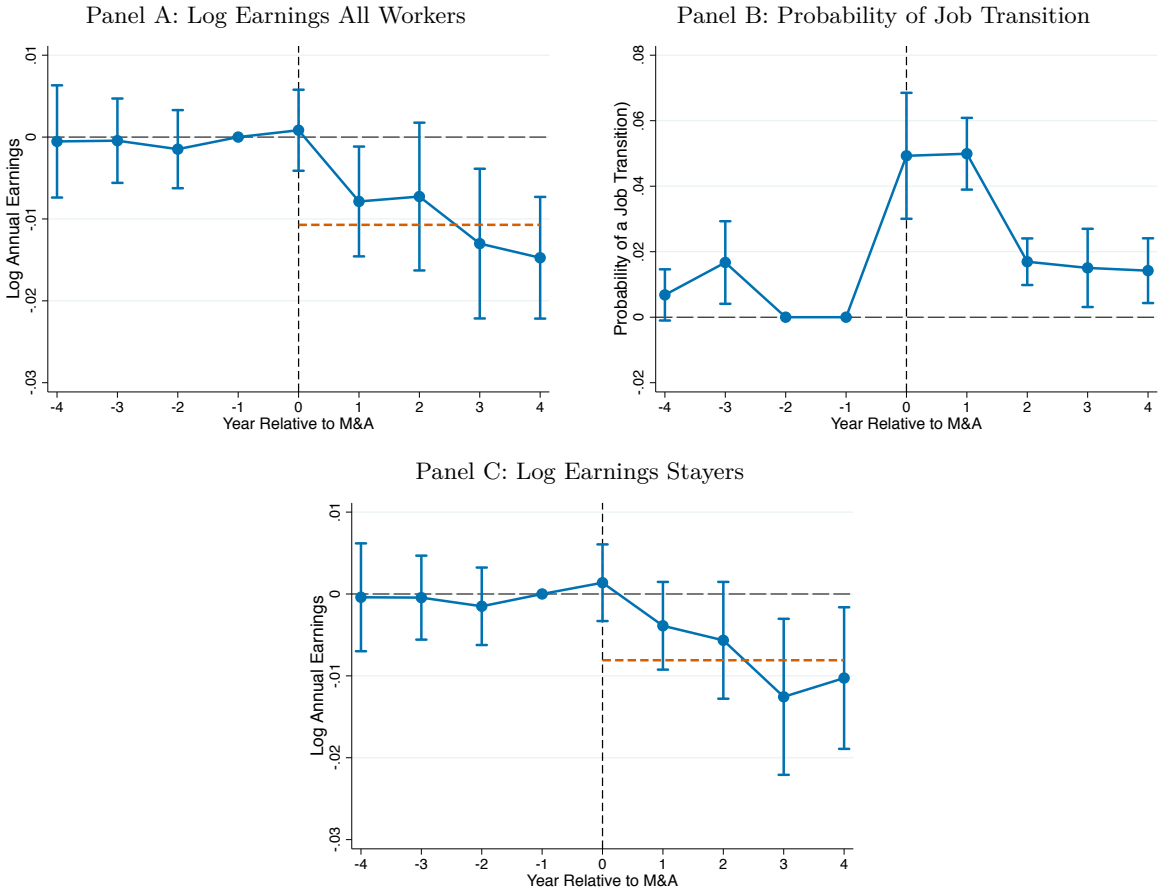


Panel B: Employment



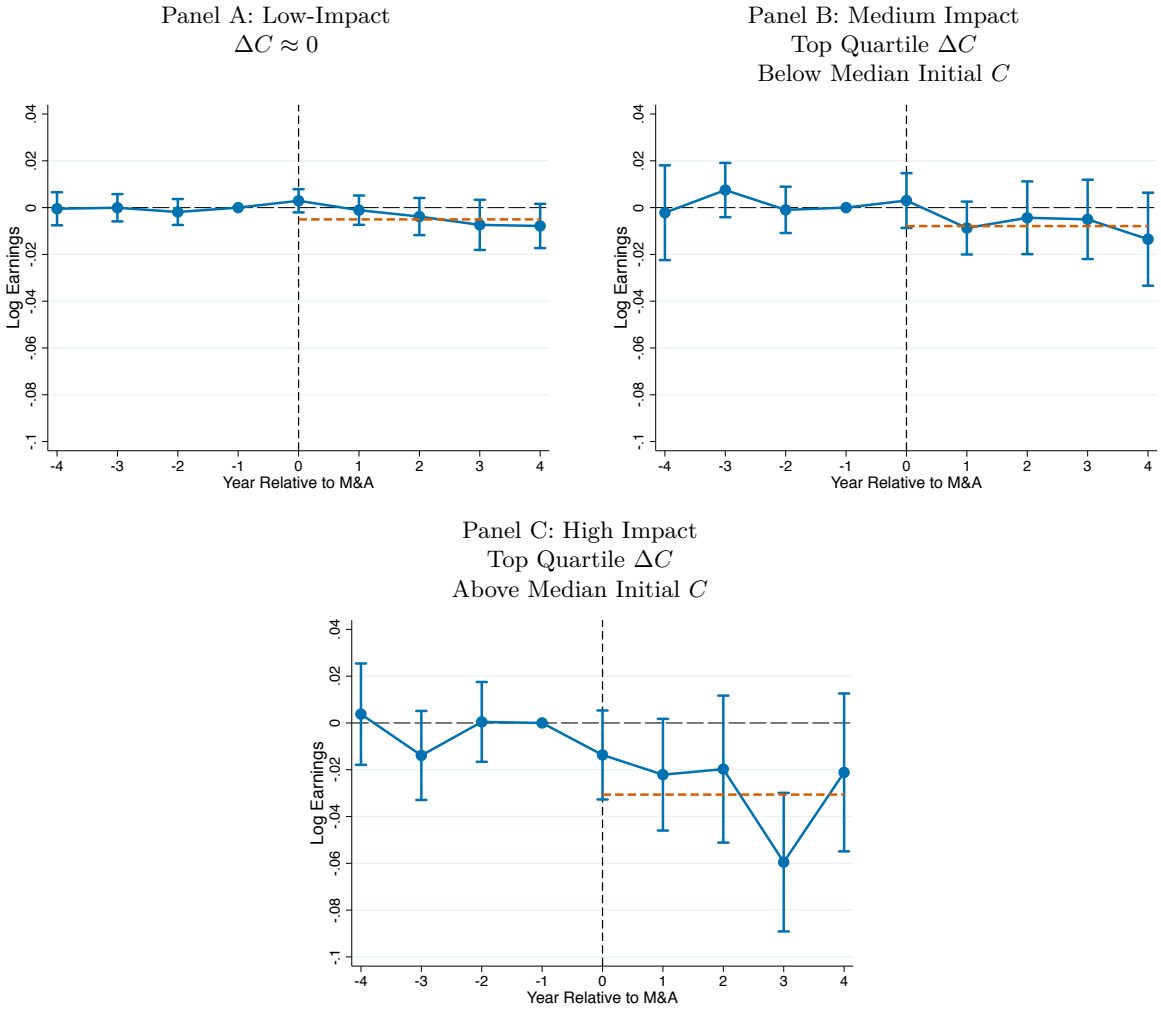
Note: This figure reports matched difference-in-differences estimates of the effect of M&A on log establishment-level employment in Panel A and establishment-level employment in Panel B (including zeros). Due to the ambiguity in the timing of the merger, some M&A establishments have already gone through the merger at time $t = 0$, while others have yet to complete the merger. For each M&A establishment I find a counterfactual establishment by matching on 4-digit NAICS (industry codes), state, $t^* - 1$ employment decile, and $t^* - 1$ average earnings decile, where t^* indicates the year of the merger. If multiple counterfactual establishments are found, I choose the counterfactual with the closest propensity score, where the propensity score is estimated by predicting treatment using a linear probability model with quadratics in employment, earnings, firm age, and an indicator equal to one if the establishment is part of a multi-unit firm. Regressions are weighted by the employment of the establishment in the year prior the merger. 95 percent confidence intervals two-way clustered at the commuting zone and 4-digit NAICS level are displayed.

Figure 4: Difference-in-Differences Estimates of the Effect of M&A on Incumbent Worker Outcomes



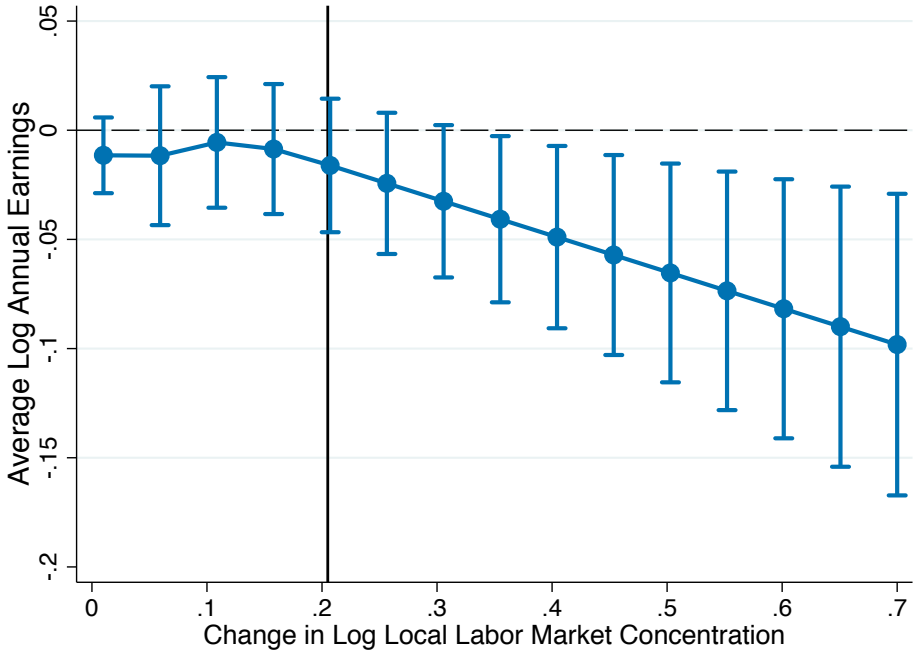
Note: This figure reports matched difference-in-differences estimates of the effect of M&A on worker outcomes. Panel A reports the impact on log annual earnings for all incumbent workers. Panel B reports the impact on job transitions. Panel C reports the impact on log annual earnings for firm stayers. A stayer is defined as a worker who is employed in time t at the same firm as in $t^* - 1$. To prevent coding mechanical changes in firm identifiers as workers switching employers, I use the full set of M&A identified in the LBD as well as worker flows in the LEHD (Benedetto et al., 2007) to recode changes in EINs that are likely due to reorganizations rather than true job switching. Treated workers are drawn from the M&A sample for which there is coverage in the LEHD. For each M&A worker, I find a counterfactual worker by matching on 4-digit NAICS (industry codes), state, gender and age bins (5-year bins). If multiple counterfactuals are found for an M&A worker, I choose the counterfactual worker with the closest propensity score, where the propensity score is estimated by predicting treatment using a linear probability model with a quadratic in firm age, a quadratic in worker age, a quadratic in firm size, and and an indicator equal to one if the worker is employed by a multi-unit firm. 95 percent confidence intervals based on standard errors two-way clustered at the worker and 4-digit NAICS by commuting zone level are displayed.

Figure 5: Difference-in-Differences Estimates of the Effect of M&A on Firm Stayers' Earnings



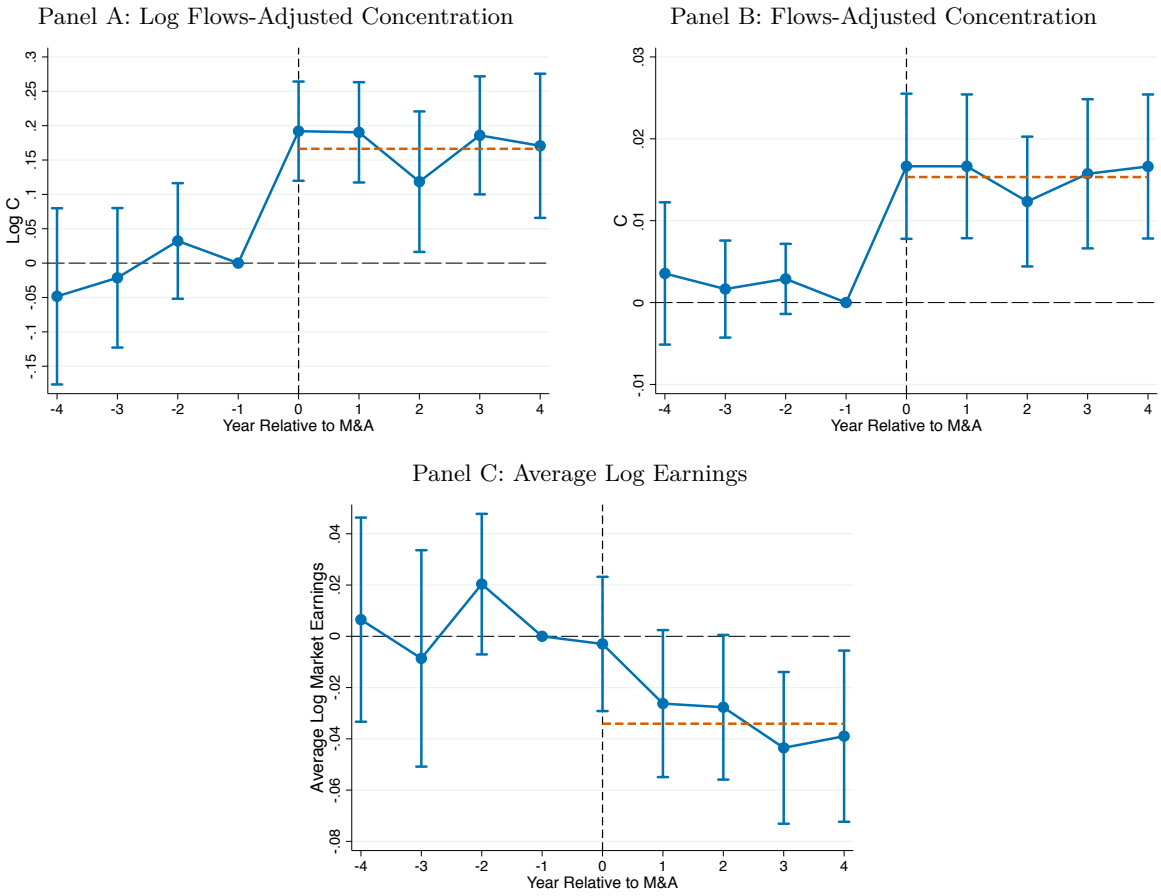
Note: This figure displays matched difference-in-differences estimates of the effect of M&A on log annual earnings. Concentration (C) is measured using the flows-adjusted measure of local labor market concentration that takes into account substitutability of jobs across industries. Panel A displays results for workers exposed to low-impact mergers, which occur when the predicted change in concentration is below the top quartile ($\Delta C \approx 0$). Panel B displays results for workers exposed to medium-impact mergers, which occur when the predicted change in concentration is in the upper quartile and the worker is employed in a below-median concentration market. Panel C displays results for workers exposed to high-impact mergers, which occur when the predicted change in concentration is in the upper quartile and the worker is employed in an above-median concentration market. The figure restricts to firm stayers who are defined as workers employed in time t at the same firm as in $t^* - 1$. For details on the matching algorithm used to identify control workers, see the notes to Figure 4 and Section 3.4.

Figure 6: Market-Level (Excluding M&A Firms) Impacts by Predicted Change in Local Labor Market Concentration



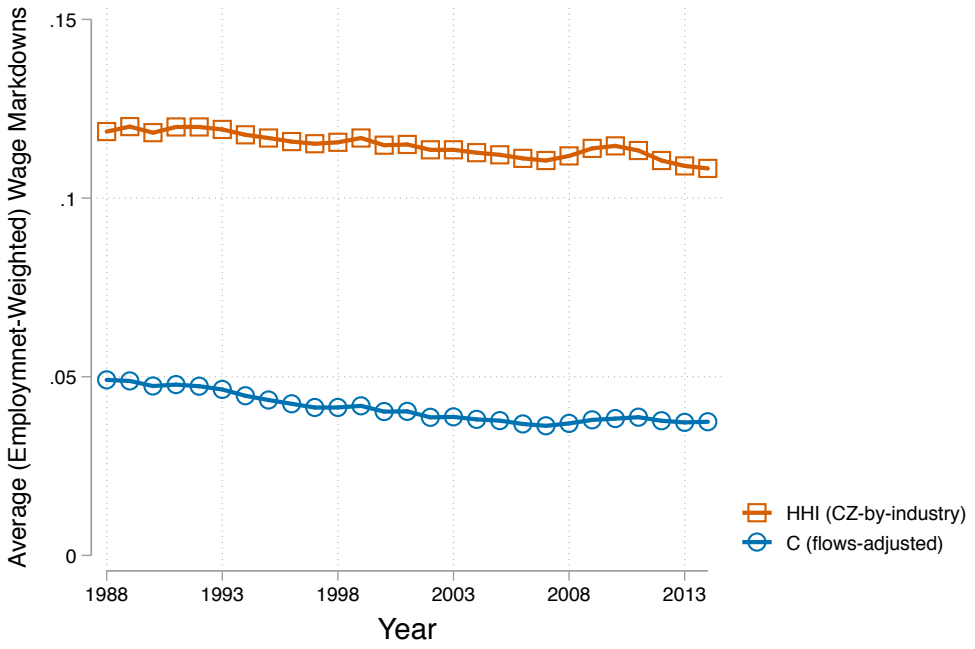
Note: This figure reports the impact of M&A on market-level earnings as a function of the predicted change in log local labor market concentration. A market is defined as a 4-digit NAICS by commuting zone cell. Local labor market concentration is measured using the flows-adjusted concentration measure (C) that incorporates information on worker flows across industries. Market-level earnings exclude the M&A firms and are constructed by residualizing on observables of the workforce, such as age, gender, imputed education, and race. The solid vertical line corresponds to the psuedo-95^{th} percentile, which is equal to the average of the 94^{th} through 96^{th} percentiles and is reported in place of the 95^{th} percentile to accommodate Census disclosure rules. 95 percent confidence intervals based on standard errors that cluster at the 4-digit NAICS by commuting zone level are displayed.

Figure 7: Difference-in-Differences Estimates of Top-Ventile Concentration Increases on Market-Level Outcomes



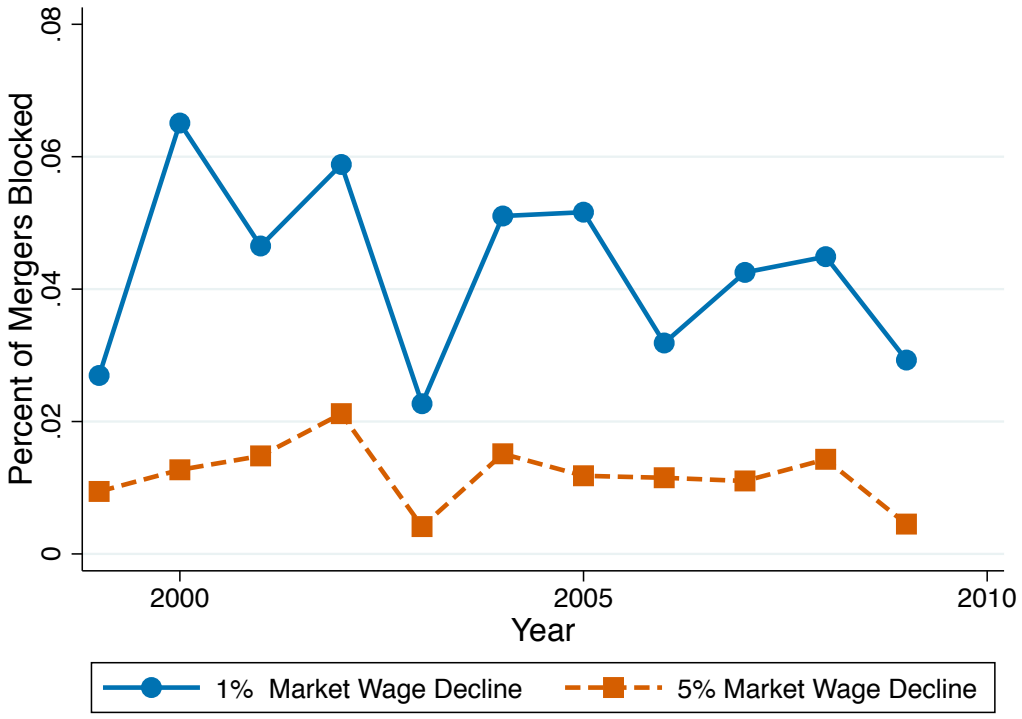
Note: This figure displays estimates of the effect of a top-ventile concentration increase on market-level outcomes. A market is defined as a 4-digit NAICS by commuting zone cell. Local labor market concentration is measured using the flows-adjusted concentration measure (C) that incorporates information on worker flows across industries. Panel A reports the impact on log flows-adjusted concentration, Panel B reports the impact on flows-adjusted concentration, Panel C reports the impact on average log market-level earnings. Market-level earnings exclude the M&A firms and are constructed by residualizing on observables of the workforce, such as age, gender, imputed education, and race. 95 percent confidence intervals based on standard errors that cluster at the 4-digit NAICS by commuting zone level are displayed.

Figure 8: Model-Implied Wage Markdowns Due to Local Labor Market Concentration Over Time



Note: This figure plots the average (employment-weighted) wage markdown over time computed from the Cournot model of labor market competition in Section 2. In the model, the markdown is a function of local labor market concentration and the market-level elasticity of labor supply. I set the market-level elasticity of labor supply equal to 0.87 (SE=0.44) for all markets, which is the value that minimizes the distance between the model-implied impacts and the market-level reduced-form estimate in Panel C of Figure 7. The blue circles correspond to estimates that measure concentration using the flows-adjusted concentration measure (C) that incorporates information on worker flows across industries. The orange squares correspond to estimates that measure concentration using an HHI that defines the labor market as a 4-digit NAICS by commuting zone.

Figure 9: Estimated Fraction of Mergers Blocked According to Different Threshold Rules



Note: This figure reports the fraction of mergers that would be blocked according to different threshold rules. The predicted impact of a merger depends on (1) the initial concentration level (2) the change in concentration and (3) the market-level elasticity of labor supply. For this figure I set the market-level elasticity of labor supply equal to 0.87 (SE=0.44) for all markets, which is the value that minimizes the distance between the model-implied impacts and the market-level reduced-form estimates in Panel C of Figure 7. A merger is considered blocked if it lowers the market-wage in at least one market by more than the given threshold.

Table 1: Summary Statistics of M&A Establishments and Control Establishments

	M&A Establishments	Control
Panel A: Establishment Characteristics	(1)	(2)
Payroll ($1000s)	11,000.00	10,340.00
Employment	250.10	240.00
Pseudo-Median Employment	116.70	117.00
Earnings Per Worker ($1000s)	43.94	42.81
Target Establishment	0.32	–
Panel B: Sectors of Establishments		
Manufacturing	0.17	0.17
Wholesale Trade	0.06	0.06
Information	0.04	0.04
Finance	0.09	0.09
Professional, Scientific and Technical	0.07	0.07
Health Care	0.10	0.10
Accommodation and Food	0.10	0.10
Tradable	0.24	0.24
Panel C: Characteristics of M&A deal		
Merger within CZ	0.29	–
Merger within Industry (4-digit NAICS)	0.61	–
C (flows-adjusted concentration)	0.04	–
Log Change in C	0.01	–
National Merger	0.59	–
Incidental	0.08	–
Unique Establishments	46,000	46,000
Unique Firms	10,000	25,000

Note: This table displays summary statistics of M&A establishments and the matched control establishments. Payroll and Earnings Per Worker are in $1000s. Employment is the employment on March 12th the year prior to the M&A event. The Pseudo-Median Employment is the average of the 49th through 51st percentiles of employment and is reported in place of the median to accommodate Census disclosure rules. Tradable industries belong to the following NAICS two-digit codes: 11, 21, 31, 32, 33 and 55. An establishment is part of a "Merger within CZ" if the acquiring firm owns at least one establishment in the same CZ as the target establishment. An establishment is part of a "merger within industry" if the acquiring firm owns at least one establishment in the same industry (4-digit NAICS) as the target establishment. C is the flows-adjusted measure of local labor market concentration that incorporates worker flows across industries. Mergers between two firms that own establishments in at least 5 commuting zones are defined as national mergers. Establishments in second or tertiary lines of business are defined as incidental to the merger. For each M&A establishment I find a counterfactual establishment by matching on 4-digit-NAICS, state, $t^* - 1$ employment decile, and $t^* - 1$ average earnings decile, where t^* is the year of the merger. If multiple counterfactual establishments are found, I choose the counterfactual with the closest propensity score, where the propensity score is estimated by predicting treatment using a linear probability model with quadratics in employment, earnings, firm age, and an indicator equal to one if the establishment is part of a multi-unit firm.

Table 2: Summary Statistics of Incumbent M&A and Control Workers

	M&A Workers	Control Workers
Panel A: Worker Characteristics	(1)	(2)
Annual Earnings	55,170.00	52,400.00
Female	0.46	0.46
College Education (Imputed)	0.32	0.31
Age	43.65	43.65
Tradeable	0.27	0.27
Target	0.37	–
Panel B: Merger Characteristics		
Merger within CZ	0.49	–
Merger within Industry (4-digit)	0.64	–
C (flows-adjusted concentration)	0.07	–
Log Change in C	0.02	–
Unique Workers	1,941,000	1,941,000

Note: This table displays summary statistics of M&A workers and matched control workers, which are drawn from the sample of M&A firms with coverage in the LEHD sample (See Figure 1). Workers must be employed at the M&A firm for at least two years prior to the merger to be in the sample. Annual Earnings are in 2011 dollars and aggregated across all employers the worker is employed by in the year. Definitions for variables which appear in Panel B appear in Section 3 and the notes to Table 1. For each M&A worker, I find a counterfactual worker by matching on 4-digit NAICS, state, gender and age bins (5-year bins). If multiple counterfactuals are found for an M&A worker, I choose the counterfactual worker with the closest propensity score, where the propensity score is estimated by predicting treatment using a linear probability model with quadratics in firm age, a quadratic in worker age, a quadratic in firm size, and and an indicator equal to one if the worker is employed by a multi-unit firm.

Table 3: Impact of M&A on Worker Outcomes

	Log Annual Earnings		Job
	All Workers	Stayers	Transition
	(1)	(2)	(3)
Post-MA	-0.011^{***}	-0.008^{**}	0.032^{***}
	(0.004)	(0.003)	(0.004)
Mean at t=-1	10.550	10.550	–
R squared	0.715	0.800	0.228
Worker-Years	32,000,000	25,700,000	34,800,000

Note: This table reports difference-in-differences estimates of the effect of M&A on log annual earnings (Columns 1 and 2) and the probability a worker transitions jobs (Column 3). I estimate a flexible specification that allows for dynamic treatment effects as depicted in Figure 4 and average the four post-event coefficients to estimate the aggregate effect reported in this table. The regressions are estimated on the sample described in the notes to Table 2, which includes details on the matching algorithm used to identify control workers. A job transition occurs if a worker switches between two firms or a worker transitions from nonemployment to employment (or vice versa). A stayer is defined as a worker who is employed in time t at the same firm as in $t^* - 1$. To prevent coding mechanical changes in firm identifiers as workers switching employers, I use the full set of M&A identified in the LBD, as well as using worker-flows (Benedetto et al., 2007) to recode changes in EINs that are likely due to reorganizations rather than true job switching. Treated workers are drawn from the M&A sample for which there is coverage in the LEHD. Standard errors are two-way clustered at the worker and 4-digit NAICS by commuting zone level. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Table 4: Hetereogeneity by Local Concentration: The Effect of M&A on Log Annual Earnings for Firm Stayers

	High Impact	Medium Impact	Low Impact		
	Pred $\Delta C^{MA} > 0$ & High Initial $C\psi$	Pred $\Delta C^{MA} > 0$ & Low Initial $C\psi$	Pred $\Delta C^{MA} \approx 0$	Diff (1)-(2)	Diff (1)-(3)
	(1)	(2)	(3)	(4)	(5)
Panel A: All Mergers					
Post-M&A	-0.031^{***}	-0.008	-0.005	-0.023^{*}	-0.026^{**}
	(0.011)	(0.007)	(0.004)	(0.013)	(0.012)
Initial C	0.072	0.011	0.079	–	–
Change in Log C	0.099	0.059	0.001	–	–
Approx Worker-Years	2,700,000	3,700,000	19,300,000	–	–
Panel B: Tradables					
Post-M&A	-0.067^{***}	0.001	-0.012^{*}	-0.068^{***}	-0.056^{**}
	(0.023)	(0.012)	(0.006)	(0.026)	(0.024)
Initial C	0.136	0.018	0.152	–	–
Change in Log C	0.099	0.041	0.000	–	–
Approx Worker-Years	600,000	1,200,000	14,000,000	–	–
Panel C: National Mergers					
Post-M&A	-0.042^{***}	-0.013^{*}	-0.008	-0.029^{**}	-0.035^{***}
	(0.013)	(0.007)	(0.005)	(0.015)	(0.013)
Initial C	0.070	0.011	0.076	–	–
Change in Log C	0.082	0.061	0.001	–	–
Approx Worker-Years	1,600,000	2,100,000	11,000,000	–	–

Note: This table presents difference-in-differences estimates of the effect of M&A on log annual earnings. I estimate a flexible specification that allows for dynamic treatment effects as depicted in Figure 5 and compute the aggregate effect as the average of the four post-event coefficients. C denotes the flow-adjusted measure of local labor market concentration. High-impact mergers are top quartile predicted changes in concentration in above-median concentration markets. Medium-impact mergers are top quartile predicted changes in concentration in below-median concentration markets. Low-impact mergers are below top quartile predicted changes in concentration. The sample restricts to firm stayers who are defined as workers employed in time t at the same firm as in $t^* - 1$, where t^* is the year of the M&A. For details on the matching algorithm used to identify control workers, see the notes to Table 2 and Section 3.4. A national merger is defined as a merger between two firms that both operate in at least five commuting zones. Tradable industries belong to the following NAICS two-digit codes: 11, 21, 31, 32, 33 and 55. Standard errors are two-way clustered at the worker and 4-digit NAICS by commuting zone level. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Table 5: Correlation between Concentration Changes and Market Outcomes

	Change in Average Log Market Earnings		Change in Log Market Size
	(1)	(2)	(3)
Change in Log $C\psi$	-0.099^{***}		0.309^{***}
	(0.005)		(0.010)
Change in Log HHI		-0.085^{***}	
		(0.006)	
Market-Years	1,083,000	1,083,000	1,083,000

Note: This table regresses changes in market-level outcomes on changes in local labor market concentration. The HHI measure is defined at the 4-digit NAICS by commuting zone level. C denotes the flow-adjusted measure of local labor market concentration. Market size is the number of employees in the market in a given year with annual earnings above \$3,250. Average market earnings are obtained by residualizing worker-level earnings using a polynomial in age, gender, race, and education and then taking the average of the residualized log wage within the market. Standard errors are clustered at the 4-digit NAICS by commuting zone level. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Table 6: Predicted vs. Actual Changes in Local Labor Market Concentration

	Actual Change in Local Labor Market Concentration				
	(1)	(2)	(3)	(4)	(5)
ΔC^{MA} (Ownership Changes)	0.834***				0.659***
	(0.032)				(0.035)
ΔC^{Exit}		0.778***			
		(0.016)			
ΔC^{Entry}			0.981***		
			(0.012)		
$\Delta C^{Reallocation}$				0.946***	0.915***
				(0.007)	(0.010)
R^2	0.014	0.254	0.107	0.915	0.927
Market-Years	1,083,000	1,083,000	1,083,000	1,083,000	1,083,000

Note: This table regresses predicted changes in local labor market concentration on actual changes in local labor market concentration. Column 1 predicts changes in concentration due only to ownership changes. Column 2 predicts changes in concentration due only to firm exit. Column 3 predicts changes in concentration due only to firm entry. Column 4 predicts changes due to any reallocation in employment across firms, which includes entry, exit, contraction or expansion. Column 5 includes both changes due to any reallocation of employment as well as ownership changes. Column 5 does not perfectly predict changes in concentration because ownership changes and reallocation changes are computed separately. In other words, the predicted change due to ownership and the predicted change due to reallocation is not sufficient information to construct the actual change in concentration. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Table 7: First-Stage Impact of Top-Ventile Concentration Increase on Log Local Concentration

	Log Concentration		
	(1)	(2)	(3)
$Q20 \times Post$	0.175***	0.239***	0.188***
	(0.043)	(0.047)	(0.039)
Market-Years	24,000	21,000	24,000
F-statistic	16.278	25.630	22.997
4-digit NAICS-by-CZ FE	Yes	Yes	Yes
1-digit NAICS-by-CZ-year FE	Yes	No	Yes
2-digit NAICS-by-CZ-year FE	No	Yes	No
Weighted by Employment	Yes	Yes	No

Note: This table presents first-stage estimates of the impact of a top-ventile concentration increase due to merger activity on the log of the flows-adjusted measure of local labor market concentration. To construct the sample, I restrict to markets that experience at least a 0.01 log increase in market concentration due to merger activity. I then split the markets at the 95^{th} percentile (ordered by changes in log market concentration). This table tests whether experiencing a top-ventile concentration increase leads to a persistent increase in log concentration in the years following the merger. Standard errors appear in parentheses. Standard errors are clustered at the 4-digit NAICS by commuting zone level. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

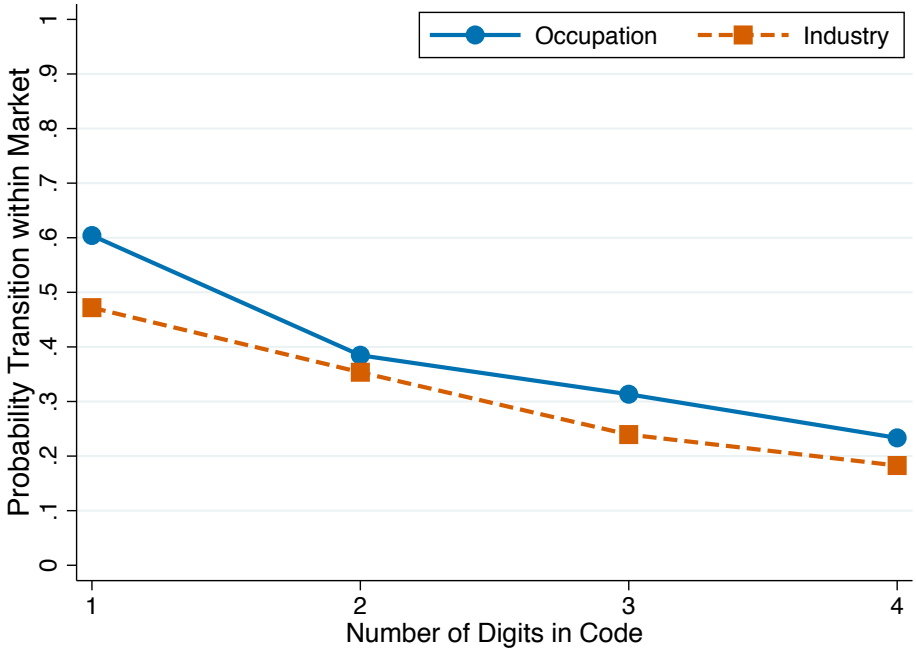
Table 8: Instrumental Variables Estimates of the Elasticity of Earnings with Respect to Local Labor Market Concentration (Flows-Adjusted)

	Average Log Market Earnings					
	(1)	(2)	(3)	(4)	(5)	(6)
Log C	-0.219^{**}	-0.182^{***}	-0.147^{*}			
	(0.094)	(0.067)	(0.083)			
Log C × Above Median C				-0.259^{**}	-0.230^{***}	-0.176^{**}
				(0.108)	(0.081)	(0.083)
Log C × Below Median C				0.059	0.065	0.058
				(0.121)	(0.120)	(0.141)
Market-Years	24,000	21,000	24,000	24,000	21,000	24,000
4-digit NAICS-by-CZ FE	Yes	Yes	Yes	Yes	Yes	Yes
1-digit NAICS-CZ-year FE	Yes	No	Yes	Yes	No	Yes
2-digit NAICS-CZ-year FE	No	Yes	No	No	Yes	No
Weighted by Employment	Yes	Yes	No	Yes	Yes	No

Note: This table reports instrumental variables estimates of the elasticity of earnings with respect to local labor market concentration (flows-adjusted). The instrument is an indicator for the market experiencing a top-ventile predicted concentration increase due to merger activity. See Table 7 for the first-stage regression and Figure 6 for the reduced form. A market is defined as a 4-digit NAICS by commuting zone cell. Standard errors appear in parentheses and are clustered at the 4-digit NAICS by commuting zone level. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

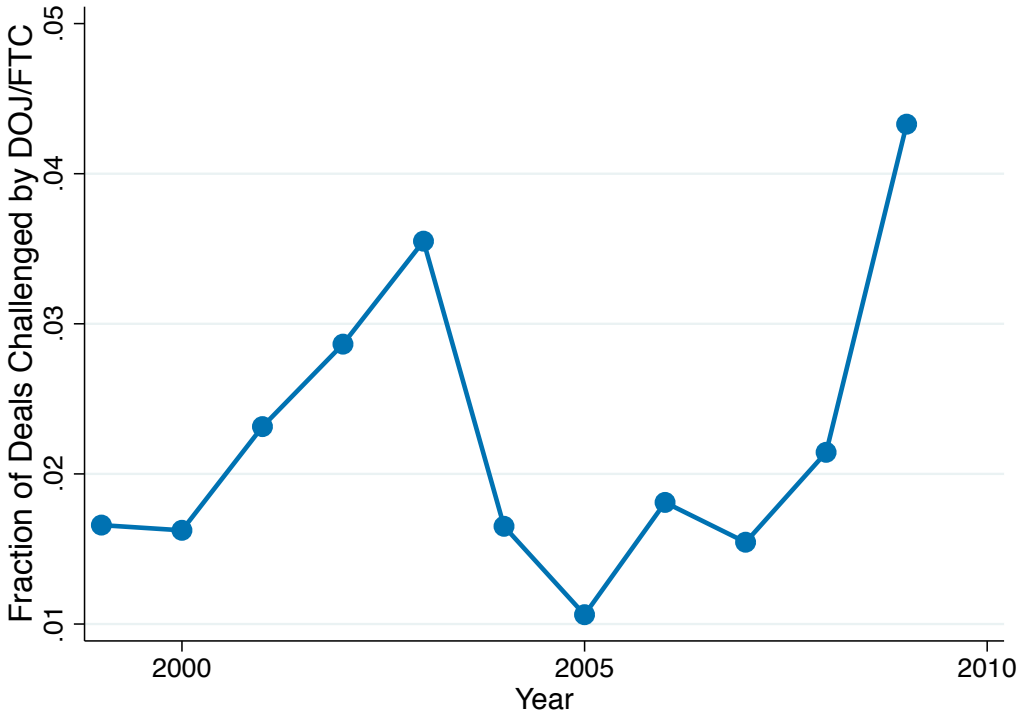
Appendix A: Additional Results

Appendix Figure A1: Job Transitions Within Industries and Occupations in Brazil



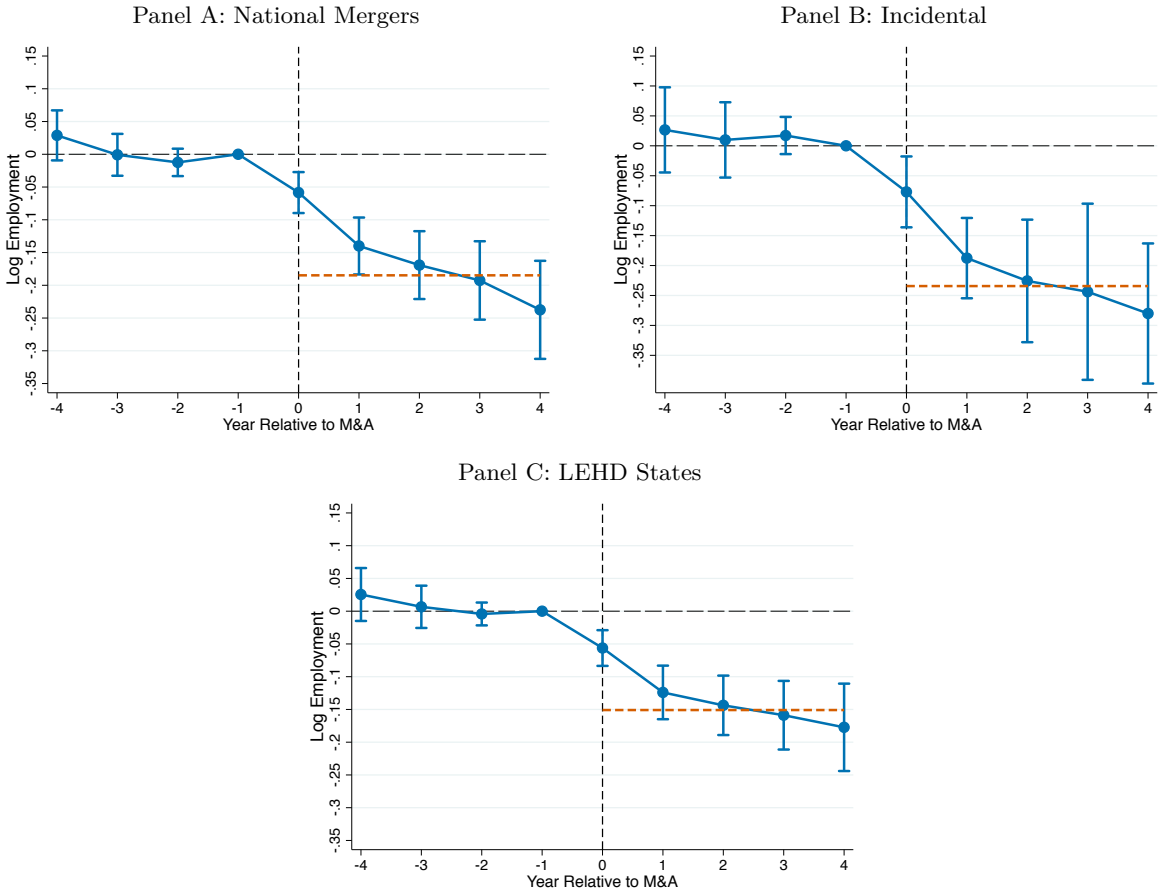
Note: This figure shows the probability a worker transitions within a given industry or occupation given the level of aggregation chosen. The data come from the *Relação Anual de Informações Sociais* (RAIS), a matched employer-employee dataset from Brazil.

Appendix Figure A2: DOJ and FTC Antitrust Enforcement Actions over Time



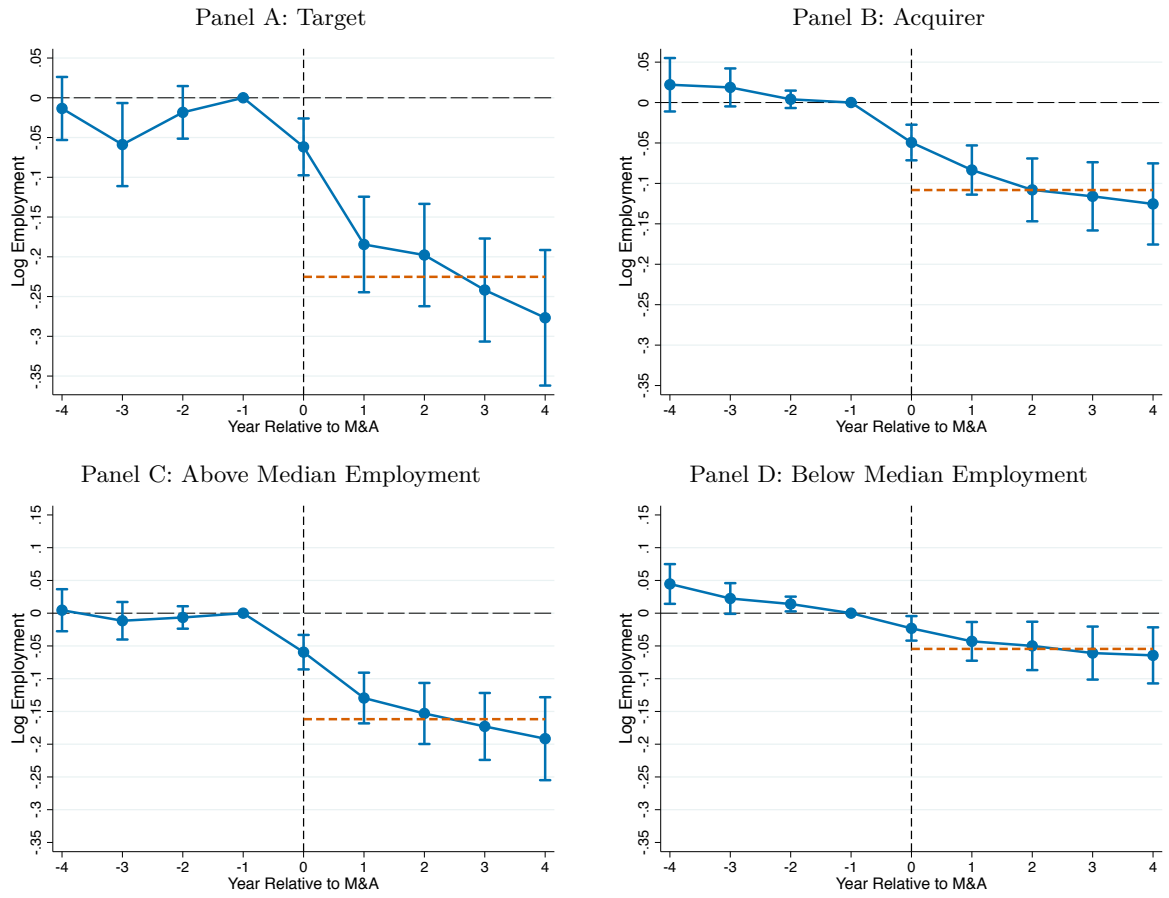
Note: This figure reports the fraction of merger notifications that are challenged each year between 1999-2009. Some deals in which the target asset's are relatively small are exempt from having to notify antitrust authorities (See Wollmann (2019) for more details). Data comes from *Hart-Scott Rodino Annual Reports* which reports the number of merger notifications as well as enforcement actions taken by the Department of Justice and Federal Trade Commission. Most of the time these enforcement actions result in the merging parties agreeing to modify their deal or abandoning the deal, with a small number eventually being blocked by federal litigation.

Appendix Figure A3: Difference-in-Differences Estimates of the Effect of M&A on Employment by Merger Characteristics



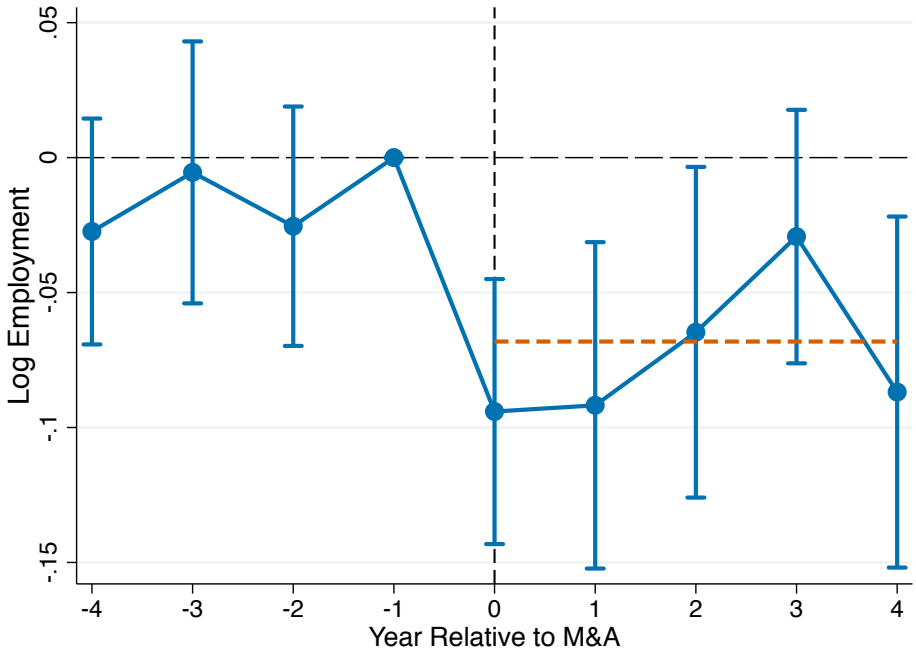
Note: This figure shows matched difference-in-differences estimates of the effect of M&A on establishment-level log employment. The regressions are estimated on the sample described in the notes to Table 1, which contain details on the matching algorithm used to identify control establishments. Mergers between two firms that both own establishments in at least 5 commuting zones are defined as national mergers. Establishments in second or tertiary lines of business are defined as incidental to the merger. LEHD states are displayed in Figure 1. 95 percent confidence intervals based on standard errors two-way clustered at the 4-digit NAICS and commuting zone level are displayed.

Appendix Figure A4: Difference-in-Differences Estimates of the Effect of M&A on Employment by Establishment Characteristics



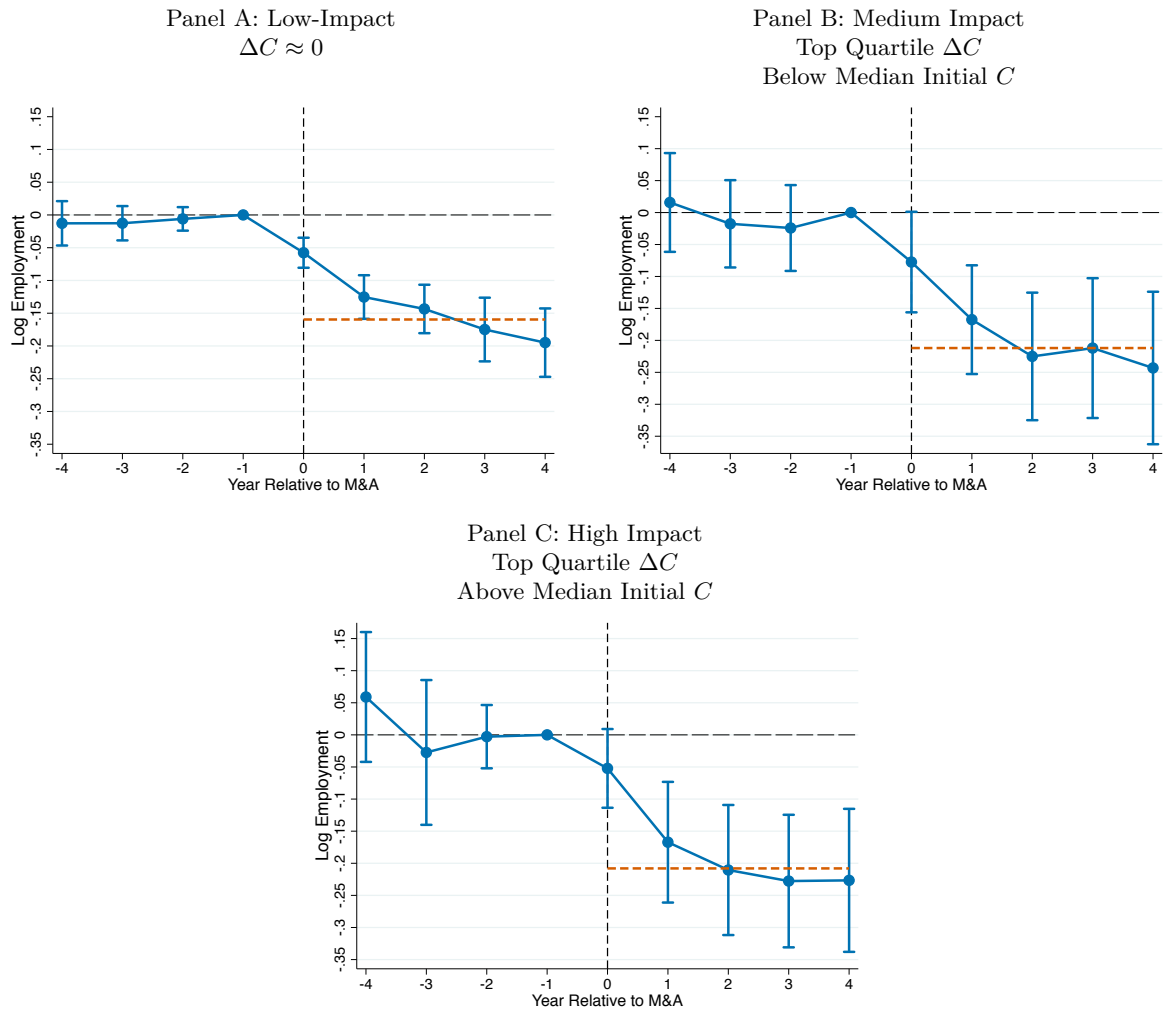
Note: This figure shows matched difference-in-differences estimates of the effect of M&A on establishment-level log employment. The regressions are estimated on the sample described in the notes to Table 1, which contain details on the matching algorithm used to identify control establishments. High employment establishments are above the median level of employment, while low employment establishments are below the median level of employment. 95 percent confidence intervals based on standard errors two-way clustered at the 4-digit NAICS industry and commuting zone level are displayed.

Appendix Figure A5: Difference-in-Differences Estimates of the Effect of M&A on Acquiring Firms' Growth Rates



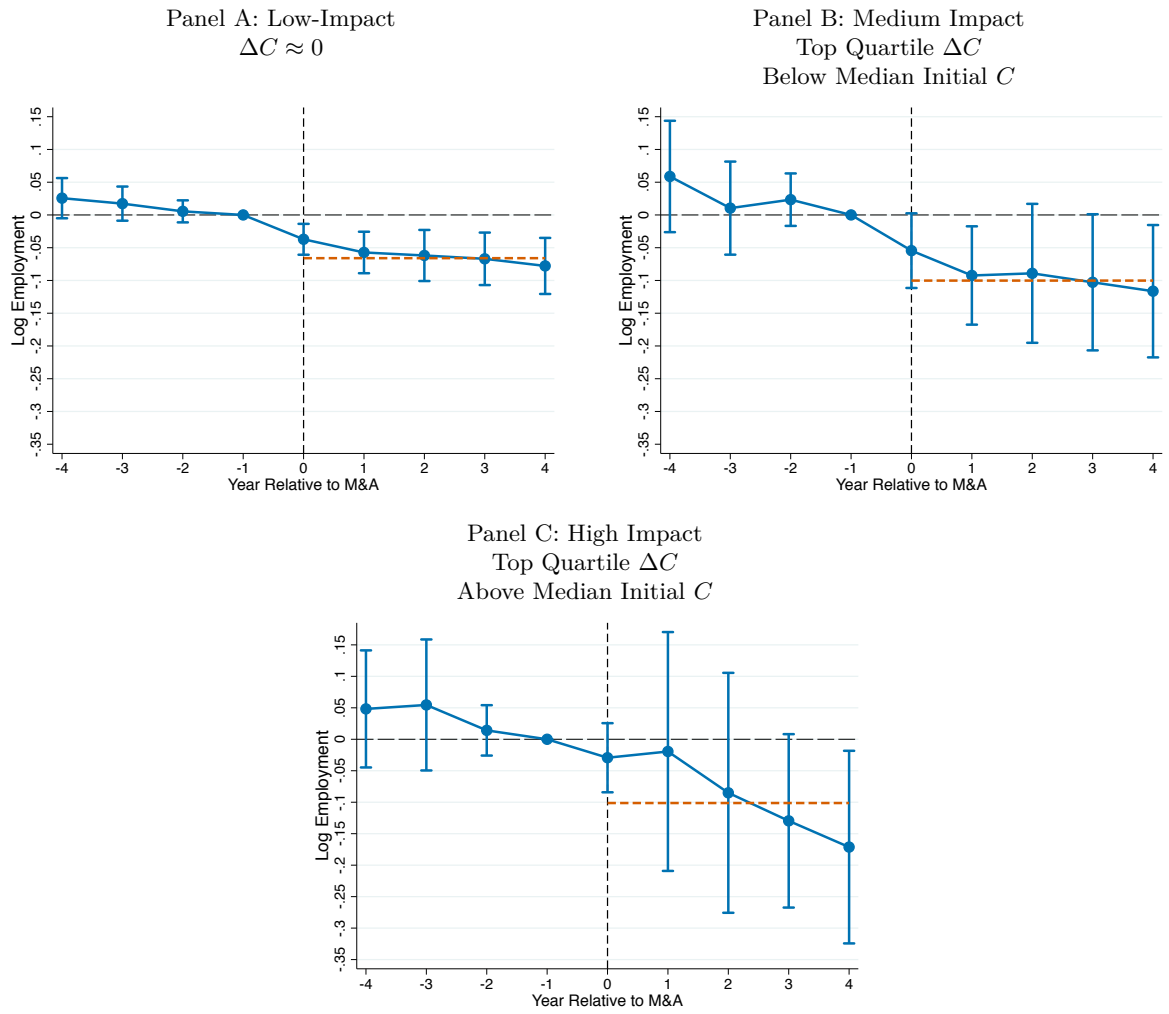
Note: This figure shows matched difference-in-differences estimates of the effect of M&A on the growth rate of the acquiring firm. Growth rates for the acquiring firm are computed using the method described in Haltiwanger et al. (2013), which corrects for mechanical growth due to M&A. To find counterfactual firms, I implement the same matching procedure discussed in Section 3.4, at the firm-level rather than the establishment level. In the case of multi-industry and multi-state firms, I match on primary industry and primary state, where the primary industry and primary states are the 4-digit NAICS and states with the most employment of the firm. Regressions are weighted by pre-M&A employment. 95 percent confidence intervals two-way clustered at the primary NAICS-4-digit code and the primary commuting zone level.

Appendix Figure A6: Difference-in-Differences Estimates of the Effect of M&A on Establishment Employment in Nontradable Industries



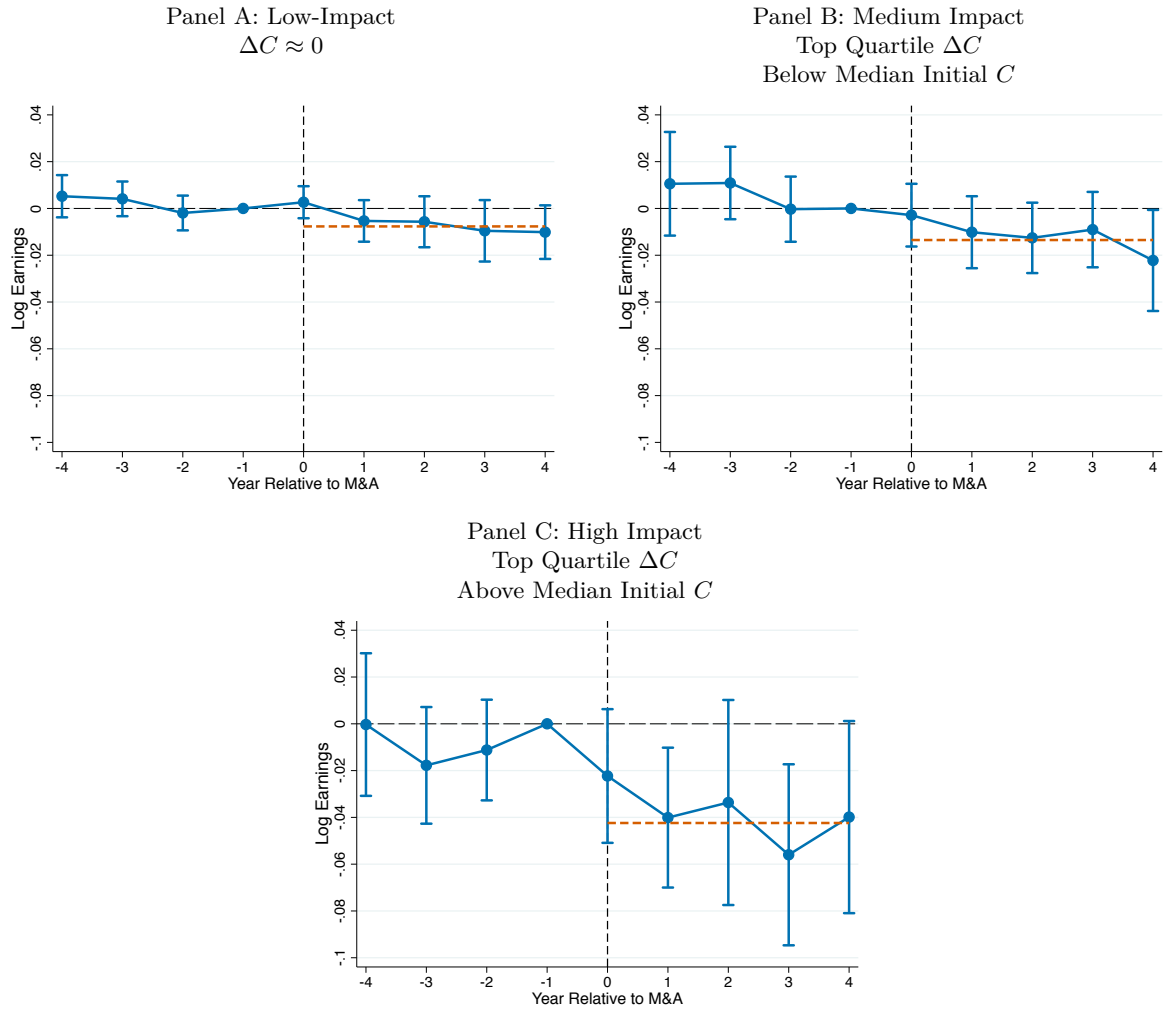
Note: This figure shows matched difference-in-differences estimates of the effect of M&A on establishment-level log employment in nontradable industries, which are defined as industries that do not belong to the following two-digit NAICS industries: 11, 21, 31, 32, 33, and 55. Details on the matching algorithm used to identify control establishments appear in the notes to Table 1 and Section 3.4. Panel A displays results for establishments exposed to low-impact mergers, which occur when the change in concentration is below the top quartile ($\Delta C \approx 0$). Panel B displays results for establishments exposed to medium-impact mergers, which occur when the change in concentration is in the upper quartile and the establishment is in a below-median concentration market. Panel C displays results for establishments in high-impact mergers, which occur when the change in concentration is in the upper quartile and the establishment is in an above-median concentration market. Concentration is measured using the flows-adjusted measure of local labor market concentration that takes into account substitutability of jobs across industries. 95 percent confidence intervals based on standard errors two-way clustered at the 4-digit NAICS and commuting zone level are displayed.

Appendix Figure A7: Difference-in-Differences Estimates of the Effect of M&A on Establishment Employment in Tradable Industries



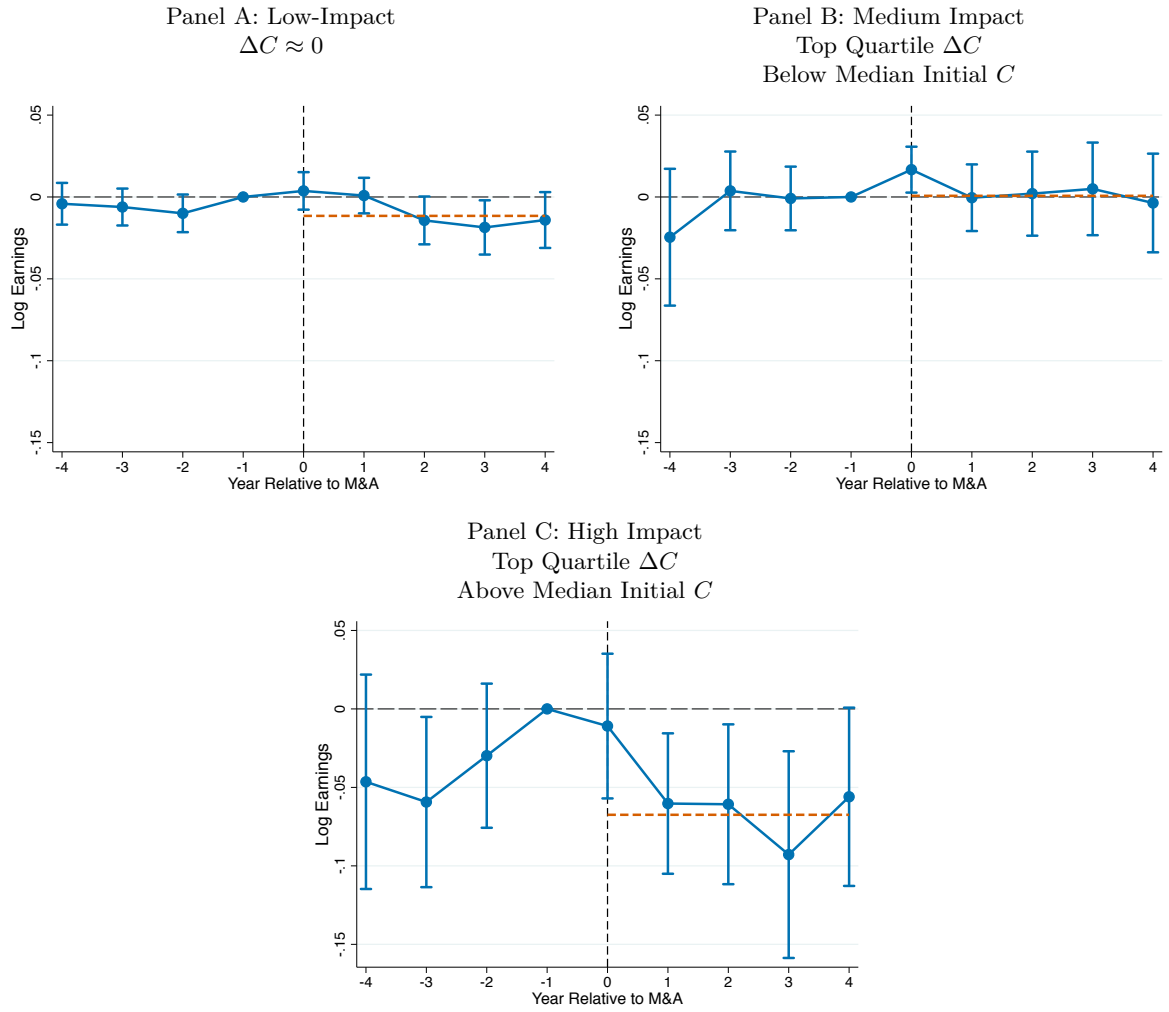
Note: This figure shows matched difference-in-differences estimates of the effect of M&A on establishment-level log employment in tradable industries, which are defined as industries that belong to the following two-digit NAICS industries: 11, 21, 31, 32, 33, and 55. For details on the matching algorithm used to identify control establishments appear in the notes to Table 1 and Section 3.4. Panel A displays results for establishments exposed to low-impact mergers, which occur when the change in concentration is below the top quartile ($\Delta C \approx 0$). Panel B displays results for establishments exposed to medium-impact mergers, which occur when the change in concentration is in the upper quartile and the establishment is in a below-median concentration market. Panel C displays results for establishments in high-impact mergers, which occur when the change in concentration is in the upper quartile and the establishment is in an above-median concentration market. Concentration is measured using the flows-adjusted measure of local labor market concentration that takes into account substitutability of jobs across industries. 95 percent confidence intervals based on standard errors two-way clustered at the 4-digit NAICS and commuting zone level are displayed.

Appendix Figure A8: Difference-in-Differences Estimates of the Effect of M&A on Firm Stayers' Earnings in National Mergers



Note: This figure displays matched difference-in-differences estimates of the effect of M&A on log annual earnings for mergers between firms that operate in at least 5 commuting zones (i.e. national mergers). Panel A displays results for workers exposed to low-impact mergers, which occur when the change in concentration is below the top quartile ($\Delta C \approx 0$). Panel B displays results for workers exposed to medium-impact mergers, which occur when the change in concentration is in the upper quartile and the worker is employed in a below-median concentration market. Panel C displays results for workers exposed to high-impact mergers, which occur when the change in concentration is in the upper quartile and the worker is employed in an above-median concentration market. Concentration is measured using the flows-adjusted measure of local labor market concentration that takes into account substitutability of jobs across industries. The figure restricts to firm stayers who are defined as workers employed in time t at the same firm as in $t^* - 1$. For details on the matching algorithm used to identify control workers, see the notes to Figure 4 and Section 3.4. 95 percent confidence intervals based on standard errors two-way clustered at the worker and 4-digit NAICS by commuting zone level are displayed.

Appendix Figure A9: Difference-in-Differences Estimates of the Effect of M&A on Firm Stayers' Earnings in Tradable Industries



Note: This figure displays matched difference-in-differences estimates of the effect of M&A on log annual earnings for firm stayers in tradable industries, which are defined as industries that belong to the following two-digit NAICS industries: 11, 21, 31, 32, 33, and 55. Panel A displays results for workers exposed to low-impact mergers, which occur when the change in concentration is below the top quartile ($\Delta C \approx 0$). Panel B displays results for workers exposed to medium-impact mergers, which occur when the change in concentration is in the upper quartile and the worker is employed in a below-median concentration market. Panel C displays results for workers exposed to high-impact mergers, which occur when the change in concentration is in the upper quartile and the worker is employed in an above-median concentration market. Concentration is measured using the flows-adjusted measure of local labor market concentration that takes into account substitutability of jobs across industries. The figure restricts to firm stayers who are defined as workers employed in time t at the same firm as in $t^* - 1$. For details on the matching algorithm used to identify control workers, see the notes to Table 2 and Section 3.4. 95 percent confidence intervals based on standard errors two-way clustered at the worker and 4-digit NAICS by commuting zone level are displayed.

Appendix Table A1: Job Transitions Within Industries and Occupations in the CPS

	Industry 4-digit	Occupation 4-digit	Occupation 3-digit
	(1)	(2)	(3)
Within	0.366	0.323	0.349
Between	0.634	0.677	0.651
Observations	22,639	22,639	22,639

Note: This table uses data from the CPS (1995-2014) to compute the probability that a job transition is within occupations and industries vs. between occupations and industries. Among this sample of job switchers that have non-missing industry and occupation values, the total number of unique 4-digit industries is 474, the total number of unique 4-digit occupations is 904, and the total number of unique 4-digit occupations is 493.

Appendix Table A2: Effect of M&A on Establishment Outcomes

	Log Emp.	Log Emp.	Emp.	Log Payroll	Estab. Survival
	(1)	(2)	(3)	(4)	(5)
Post-MA	-0.144^{***}	-0.081^{***}	-108.800^{***}	-0.121^{***}	-0.031^{***}
	(0.021)	(0.015)	(28.010)	(0.019)	(0.006)
Mean at t=-1	5.955	4.965	767.900	9.574	–
R squared	0.803	0.777	0.824	0.845	0.425
Weighted	Yes	No	Yes	Yes	Yes
Establishment-Years	753,000	753,000	824,000	753,000	824,000

Notes: This table reports difference-in-differences estimates of the effect of M&A on establishment-level outcomes. I estimate a flexible specification that allows for dynamic treatment effects as depicted in Figure 3 and average the four post-event coefficients to estimate the aggregate effect reported in this table. The regressions are estimated on the sample described in the notes to Table 1, which includes details on the matching algorithm used to identify control establishments. Weighted results are weighted by the employment in the establishment in the year prior to the merger. Standard errors are two-way clustered at the 4-digit NAICS and commuting zone level. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Appendix Table A3: Heterogeneity and Robustness of the Effect of M&A on Log Establishment Employment

	National	Incidental	LEHD States	Acquirer	Target	Low Emp	High Emp
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Post-MA	−0.185***	−0.234***	−0.151***	−0.108***	−0.225***	−0.055***	−0.162***
	(0.027)	(0.050)	(0.024)	(0.019)	(0.033)	(0.018)	(0.024)
Estab-Years	440,000	60,000	400,000	510,000	240,000	380,000	380,000

Notes: This table presents difference-in-differences estimates of the effect of M&A on establishment-level log employment. I estimate a flexible specification that allows for dynamic treatment effects over time and average the four post-event coefficients as depicted in Figure 3 to estimate the aggregate effect reported in this table. National mergers are defined as mergers between two firms that operate in at least 5 commuting zones. Incidental establishments are establishments in secondary or tertiary industries of the merging entities. LEHD states are displayed in Figure 1. High employment establishments are above the median level of employment in the analysis sample, while low employment establishments are below the median level of employment. For details on the matching algorithm used to identify control establishments, see the notes to Table 1 and Section 3.4. Standard errors are two-way clustered at the 4-digit NAICS and commuting zone level. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Appendix Table A4: Robustness: Impact of M&A on Log Annual Earnings for Firm Stayers by Concentration Changes

	High Impact	Medium Impact	Low Impact		
	Pred $\Delta C^{MA} > 0$ & High Initial $C\psi$	Pred $\Delta C^{MA} > 0$ & Low Initial $C\psi$	Pred $\Delta C^{MA} \approx 0$	Diff (1)-(2)	Diff (1)-(3)
	(1)	(2)	(3)	(4)	(5)
Panel A: Tradables Industrial HHI<500					
Post-M&A	−0.072***	0.007	−0.013	−0.079***	−0.059**
	(0.026)	(0.010)	(0.008)	(0.028)	(0.027)
Panel B: Above Median Employment Firms					
Post-M&A	−0.049***	−0.011	−0.017**	−0.038**	−0.031**
	(0.012)	(0.009)	(0.008)	(0.015)	(0.014)
Panel C: Known Location in LEHD					
Post-M&A	−0.032**	0.002	−0.005	−0.034**	−0.027*
	(0.014)	(0.009)	(0.004)	(0.016)	(0.015)
Approx Worker-Years	2,700,000	3,700,000	19,300,000	–	–

Note: This table reports difference-in-differences estimates of the effect of M&A on log annual earnings. I estimate a flexible specification that allows for dynamic treatment effects and compute the aggregate effect as the average of the four post-event coefficients. The sample restricts to firm stayers who are defined as workers employed in time t at the same firm as in $t^* - 1$. For details on the matching algorithm used to identify control workers, see the notes to Table 2 and Section 3.4. Tradable industries belong to the following NAICS two-digit codes: 11, 21, 31, 32, 33 and 55. HHI<500 implies the firm produces in a 4-digit industry in which the national HHI for the 4-digit industry is less than 500. Known location in the LEHD implies that the commuting zone of the worker in the LEHD data is known with certainty. Standard errors are two-way clustered at the worker and 4-digit-NAICS by commuting zone level. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Appendix Table A5: Summary Statistics of Top-Ventile Markets vs. Other Markets

	Top Ventile Markets	Below Top Ventile Markets
	(1)	(2)
Manufacturing	0.23	0.15
Wholesale Trade	0.12	0.10
Retail Trade	0.10	0.15
Finance	0.07	0.06
Health	0.15	0.09
College Graduate	0.24	0.25
West	0.29	0.36
South	0.36	0.25
Age	39.51	39.31
Female	0.45	0.45
Total Markets	200	3,300

Note: This table displays summary statistics for the sample of markets that experience at least one percent change in the flows-adjusted concentration measure due to merger activity. I further split the summary statistics by whether the market experiences a concentration increase in the top-ventile of all concentration increases. An indicator for top-ventile is used as an instrument to identify the impact of local labor market concentration on labor market outcomes in Table 8.

Appendix Table A6: Heterogeneity and Robustness: IV Estimates of the Elasticity of Earnings with Respect to Local Labor Market Concentration (Flows-Adjusted)

	Average Log Market Earnings				
	(1)	(2)	(3)	(4)	(5)
Log C × National	−0.262*	−0.258**	−0.309*		
	(0.146)	(0.128)	(0.176)		
Log C × Tradable				−0.331*	
				(0.180)	
Log C × Nontradable				−0.202**	
				(0.102)	
Log C × Tradable × High C					−0.392*
					(0.216)
Log C × Tradable × Low C					0.048
					(0.096)
Log C ×Non-tradable × High C					−0.235**
					(0.117)
Log C × Non-tradable × Low C					0.051
					(0.121)
Market-Years	24,000	24,000	24,000	24,000	24,000
4-digit NAICS-by-CZ FE	Yes	Yes	Yes	Yes	Yes
1-digit NAICS-by-CZ-year FE	Yes	Yes	Yes	Yes	Yes

Note: This table reports instrumental variables estimates of the elasticity of earnings with respect to local labor market concentration (flows-adjusted) by using a top-ventile merger as the excluded instrument for concentration. A market is defined as a 4-digit NAICS by commuting zone cell. In Column 1, a national merger is defined as a merger between two firms both operating in at least two commuting zones. In Column 2, a national merger is defined as a merger between two firms both operating in at least 5 commuting zones. In Column 3, a national merger is defined as merger between two firms both operating in at least 10 commuting zones. Tradable industries belong to the following NAICS two-digit codes: 11, 21, 31, 32, 33 and 55. Nontradable industries belong to any other NAICS two-digit code. Standard errors clustered at the 4-digit NAICS by commuting zone level appear in parentheses. All regressions are weighted by employment. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Appendix Table A7: Industries Ranked by Labor Market Concentration Measures

Panel A: Ordered by Flows-Adjusted Local Concentration		
Rank	Industry	Concentration
1	Construction	0.014
2	Other	0.015
3	Real Estate	0.016
4	Professional, Scientific and Technical	0.017
5	Management of Businesses	0.018
6	Administrative Support	0.023
7	Wholesale Trade	0.026
8	Agriculture	0.041
9	Food and Accommodation	0.042
10	Arts and Entertainment	0.054
11	Retail Trade	0.056
12	Health Care	0.056
13	Education	0.063
14	Finance	0.068
15	Public Administration	0.080
16	Transportation	0.097
17	Information	0.108
18	Mining	0.144
19	Manufacturing	0.172
20	Utilities	0.347
Panel B: Ordered by HHI (4-digit NAICS by commuting zone)		
1	Construction	0.056
2	Professional, Scientific and Technical	0.059
3	Other	0.083
4	Agriculture	0.092
5	Real Estate	0.099
6	Food and Accommodation	0.110
7	Wholesale Trade	0.112
8	Administrative Support	0.115
9	Management of Businesses	0.156
10	Finance	0.169
11	Health Care	0.184
12	Arts and Entertainment	0.202
13	Education	0.220
14	Mining	0.234
15	Retail Trade	0.247
16	Information	0.307
17	Transportation	0.312
18	Manufacturing	0.346
19	Public Administration	0.365
20	Utilities	0.617

Note: This table orders industries by average (employment-weighted) concentration. In Panel A, local labor market concentration is measured using the flows-adjusted concentration measure that adjusts for cross-industry labor mobility. In Panel B, local labor market concentration is measured using a standard Herfindahl-Hirschman Index measured at the 4-digit NAICS by commuting zone level.

Appendix Table A8: Probability of Within 4-digit NAICS transitions

Rank	Industry	Within Industry Transition Rate
1	Management of Businesses	0.092
2	Arts and Entertainment	0.139
3	Real Estate	0.149
4	Wholesale Trade	0.149
5	Retail Trade	0.157
6	Other	0.193
7	Administrative Support	0.209
8	Manufacturing	0.211
9	Transportation	0.217
10	Public Administration	0.229
11	Information	0.248
12	Food and Accommodation	0.258
13	Professional, Scientific and Technical	0.268
14	Construction	0.283
15	Health Care	0.309
16	Education	0.310
17	Agriculture	0.313
18	Utilities	0.325
19	Finance	0.337
20	Mining	0.347

Note: This table orders industries by average (employment-weighted) within 4-digit industry transitions rates. The interpretation of the 0.21 on manufacturing is as follows: of all the job transitions from workers in 4-digit NAICS codes that belong to manufacturing (i.e. 2-digit codes 31-33), 21 percent of those transitions are to a job in the same 4-digit NAICS code.

Appendix Table A9: Across-Market Correlation between Employment and Local Concentration

	Log HHI CZ-by-industry	Log C
	(1)	(2)
Log Employment	-0.284^{***}	-0.038^{***}
	(0.002)	(0.002)
R^2	0.317	0.004
Market-Years	1,166,000	1,166,000

Note: This table regresses log flows-adjusted concentration (Column 1) and log HHI (Column 2) on total market employment. An observation in this regression is a market (4-digit NAICS by commuting zone) by year. Standard errors appear in parentheses and are clustered at the 4-digit NAICS by commuting zone level. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Appendix B: Data Appendix

B.1 Longitudinal Business Database

B.1.1 Overview

The establishment-level data is drawn from the U.S. Census Bureau's Longitudinal Business Database (LBD), a near-universe of establishments operating with positive employment in the United States, from 1975-2015 (for this project I have access to data starting from 1985). In the LBD, an establishment is defined as a specific physical location where business occurs. The LBD contains information on payroll, employment, industry, and location. In addition to establishment-level identifiers, the LBD contains enterprise-level identifiers (labeled *firmid*), where an enterprise reflects all establishments under common ownership control.

B.1.2 LBD Variable Definitions

firmid: The enterprise-level identifier that identifies the ultimate ownership of the establishment. While the variable name is *firmid*, this is distinct to the firm-level identifier that is available in the LEHD, which is the EIN. Therefore, throughout the paper, I refer to the *firmid* available in the LBD as the enterprise ID.

lbdnum: The establishment-level identifier that indicates a single physical location. The identifier is time-invariant and does not change due to changes in ownership of the establishment.

Employment: Establishment-level employment as of March 12^{th}.

Payroll: Annual establishment-level payroll.

Industry: Unless otherwise stated, industry is defined by 4-digit North American Industry Classification Systems (NAICS) codes. In 1997, the U.S. Census switched from using Standard Industrial Classification (SIC) to NAICS. While most of the analysis in the paper does not require industrial classification pre-1997 (I study mergers 1999-2009), the analysis that does require pre-1997 industrial classification uses time-consistent NAICS codes provided by Fort et al. (2016).

Tradable: Tradable establishments are listed as belonging to the following NAICS two-digit codes: 11, 21, 31, 32, 33 and 55. 11 is agriculture, forestry and fishing, 21 is mining, quarrying and oil and gas extraction, 31-33 are manufacturing and 55 is management of companies and enterprises.

Nontradable: Nontradable establishments are any establishments that are not in the tradable group.

HHI CZ-by-industry: The sum of squared market shares where the market is defined by a commuting zone by 4-digit NAICS interaction.

HHI CZ: The sum of squared market shares where the market is defined by a commuting zone.

National merger: A national merger is defined as a merger between two firms that own establishments in multiple commuting zones. For most results, I require both firms involved in the merger to own establishments across at least 5 commuting zones. In some specifications I alter this definition to at least 2 or at least 10 commuting zones.

Incidental: An establishment is incidental to a merger if the establishment produces in a secondary or tertiary lines of business.

B.2 Constructing Firm Growth Rates in the LBD

To construct the growth rate of firm j in year t, I compute:

$$g_{jt} = \frac{E_{j,t} - E_{j,t-1}}{\frac{1}{2}(E_{j,t} + E_{j,t-1})} \tag{29}$$

Where $E_{j,t}$ is employment in firm j at time t and $E_{j,t-1}$ is employment in firm j at time $t-1$. In constructing $E_{j,t}$ and $E_{j,t-1}$ I use the longitudinal establishment identifiers to correct for changes in employment due only to changes in ownership. For example, imagine a single unit firm with 100 employees buys another single unit firm with 100 employees. If no employees are laid off, then $E_{j,t} = 200$ and $E_{j,t-1} = 200$. Therefore, the increase in 100 workers in firm j is not counted as employment growth, given all of those workers were previously employed by the target firm. Therefore, in the absence of layoffs, the merger will result in zero employment growth.

If instead, the firm lays off half the workforce in the target firm, then $g_{jt} = \frac{-50}{200} = -0.25$. Therefore, in this case, the firm shrank by -0.25 even though firm j technically employs more workers at time t than at time $t-1$. If M&A incentivizes organic growth through new establishments, then this will be captured in the firm-level analysis. For example, if the acquiring firm lays off half the workforce at the target firm (-50), but subsequently opens a brand new establishment with 100 workers, the net growth will be equal to $\frac{50}{200} = 0.25$.

B.3 Longitudinal Employer Household Dynamics

Earnings: The cumulative annual earnings paid to a given worker aggregated across all employers. Earnings in the LEHD include "gross wages and salaries, bonuses, stock options, tips and other gratuities, and the value of meals and lodging" (BLS, 1997). Therefore, earnings do not include health care benefits.

Dominant Employer: If an individual has earnings from multiple employers in a given year, then the employer associated with the most earnings is the dominant employer.

Education: I primarily distinguish between college and no college in this paper. One important caveat for the education variable is that a large portion of the education variables are imputed

(around 80 percent). The imputation procedure is performed by Census researchers and is done by linking the LEHD to the Decennial Census. State-specific logit models are then estimated to predict the education levels for all workers with missing education using the following set of observables: age categories, earnings categories, and industry dummies.

Age: The age of the worker.

EIN: A federal employer identification number used for tax purposes. A given firm (e.g. General Electric) may own multiple EINs. Additionally, a given EIN may own multiple establishments. Therefore, the EIN is a concept between an enterprise and an establishment.

SEIN: state employer identification number. A given firm (e.g. General Electric) may own multiple EINs. Within each state, a firm has a unique SEIN. A given SEIN, however, may own multiple establishments within a state. Therefore, the SEIN is a unit of aggregation between a firm (i.e. firmid in the LBD) and an establishment (i.e. lbdnum in the LBD).

B.4 Linking the LBD and LEHD

In the LBD, I identify M&A by switches in the variable "firmid." Therefore, when turning to worker-level analysis, I sample all the workers that are employed in the firms engaged in the merger activity. However, the LEHD contains EIN numbers, and not a "firmid." To link the two datasets, I use the Standard Statistical Establishment List (SSEL) as a bridge. The SSEL is an establishment-level dataset that is used to construct the LBD. The SSEL contains EIN and therefore can be used to link the LEHD and LBD.

Appendix C: Model Appendix

C.1 Derivation of Market-Level Wage in Cournot Model

The firm-specific labor supply elasticity in the Cournot model is given by:

$$\frac{1}{\eta_j} = \frac{\partial w_m(L_m)}{\partial l_j}\frac{l_j}{w_m(L_m)} = \frac{\partial w_m(L_m)}{\partial L_M}\frac{\partial L_m}{\partial l_j}\frac{l_j}{w_m(L_m)}\frac{L_m}{L_m} = \frac{s_j^l}{\eta_m} \tag{30}$$

Plugging η_j into Equation (**??**) and rearranging yields:

$$\frac{\theta_j}{w_m} = \frac{s_j^l}{\eta_m} + 1 \tag{31}$$

where η_m is the elasticity of labor supply facing the entire market and s_j^l is firm j's employment share. Multiplying both sides of the equation by s_j^l and summing over all j first-order conditions yields:

$$\sum_j s_j^l \frac{\theta_j}{w_m} = \sum_j s_j^l \left(\frac{s_j^l}{\eta_m} + 1\right) = \frac{HHI}{\eta_m} + 1 \tag{32}$$

where $HHI_m = \sum_j (s_{jm})^2$ is the Herfindahl-Hirschman index based on employment shares. Therefore, letting θ_m be the average value of marginal product in the market, the market wage is equal to:

$$w_m = \left(\frac{\eta_m}{HHI_m + \eta_m}\right)\theta_m \tag{33}$$

C.2 Relationship between C and standard HHI measures

Denote HHI_{mc}^{CZ-IND} as the HHI_m index if the definition of the labor market is an industry by commuting zone cell (in practice 4-digit NAICS by commuting zone). Denote HHI_{mc}^{CZ} as the HHI_m index if the definition of labor market is a commuting zone. Then it is straightforward to show the following proposition:

Proposition 3. *With no job mobility between industries, then $C_{mc} = HHI_{mc}^{CZ-IND}$. With random mobility across industries, then $C_{mc} = HHI_{mc}^{CZ}$.*

First, take the case in which there is zero mobility between industries. In this case, $P(m|m) = 1$ and $P(k|m) = 0$ for all $m \neq k$. Therefore, $_{m\to k} = 0$ for all $k \neq m$. This implies that the weighted market share of firm j in market m in commuting zone c is equal to the standard labor market share ($\tilde{s}_{jmc} = s_{jmc}$). Therefore:

$$C_{mc} = \sum_{j\in c}(\tilde{s}_{jmc})^2 = \sum_{j\in m}(s_{jmc})^2 = HHI_{mc}^{CZ-IND}$$

Where the second equality substitutes $\tilde{s}_{jmc} = s_{jmc}$ and follows from the fact that $s_{jmc} = 0$ for all firms that are not employing workers in industry m (indicating the second summation is not over all firms in the commuting zone, but rather all firms in the given industry m).

If workers move randomly across industries, then within a commuting zone $\frac{P(k|m)}{P(m|m)} = \mathbb{E}[\frac{L_k}{L_m}]$. That is, the relative transition probabilities are simply equal to the relative sizes, where again, the relative size is the expectation across commuting zones. Therefore, $_{m\to k} = 1$ for all k. Denoting $\sum_{k\in c} l_{jkc} = l_{jc}$ as the total employment of firm j in commuting zone c and s_{jc} as firm j's share of total employment, C_{mc} becomes:

$$C_{mc} = \sum_{j\in c}\left(\frac{\sum_{m'\in c} l_{jm'c}}{\sum_{m'\in c} L_{m'c}}\right)^2 = \sum_{j\in c}(s_{jc})^2 = HHI_{mc}^{CZ}$$

□

C.3 Example of production function with overhead labor

Following Bartelsman et al. (2013), I assume each firm has a production technology of the following form:

$$Y_j = \ _j(l_j - f_j) \ \ k \tag{34}$$

Where f_j is a fixed level of overhead labor needed for production. While f_j is firm-specific, it is not a parameter chosen by the firm. Each firm has a potentially different amount of overhead labor it needs to employ to produce and this is taken as exogenous. Given this functional form, the marginal product of labor is given by:

$$_j\frac{\partial F\psi}{\partial l_j}= \quad _j \ (l_j - f_j) \ ^{-1}k\psi \tag{35}$$

Conceptually, I allow mergers to impact technology in two ways. First, mergers could reduce the level of f_j for a firm through pooling resources. For example, imagine a fixed cost of production is setting up a human resources department. The merged firm may not need two human resources departments and therefore can layoff the entire human resources department at one of the firms. Note that in this case, the layoffs have no impact on marginal product of the remaining workers. To see this, note that total labor is equal to the labor employed for fixed costs of production, and labor employed for variable costs (i.e. $l_j = v_j - f_j$). Therefore:

$$\frac{\partial \psi_j \frac{\partial F}{\partial l_j}}{\partial f_j} = \quad _j \ (\quad -1)(l_j - f_j) \ ^{-2}k\psi(\frac{\partial l_j}{\partial f_j} - \frac{\partial f_j}{\partial f_j}) = 0 \tag{36}$$

where the last equality follows due to the fact $\frac{\partial l_j}{\partial f_j} = -\frac{\partial f_j}{\partial f_j}$. Therefore, laying off workers related to fixed costs of production has no impact on the marginal product of labor. Therefore, assuming no changes in labor market power or product market power, reductions in labor due to reductions in fixed cost should result in decreases in employment with no change in wages. In this case, mergers lower the labor share of the combined firm. This is the same channel discussed in Autor et al. (2020), who argue the fall in the labor share is due to production shifting to large firms that have lower share of fixed costs in labor over total value-added.

C.4 Simple Cournot Model with Entry

This section presents a model of a labor market where firms compete under Cournot assumptions and there is free entry. The main point of this section is to provide a simple formulation of a model in which concentration and earnings will be correlated, but the source of the correlation is not necessarily monopsony power. To begin, I assume each firm has to pay a fixed cost F. Firms are homogenous and produce a perfectly competitive good at with constant marginal revenue product of labor θ. To solve the model analytically, I assume a linear form for the the market wage:

$$w\psi= \quad + \quad L\psi \tag{37}$$

Where $L\psi= \sum_{j\in m} l_j$ is the total labor demand of the market. Firm $j\psi$chooses labor input l_j to maximize profits, taking as given the labor demands of all other firms. This results in the following first-order condition:

$$\theta\psi - \quad l_j - (\quad + \quad L) = 0 \tag{38}$$

Summing up the FOCs for all firms in the market yields the aggregate employment $L\psi$ equal to:

$$L\psi = \frac{N\psi}{N\psi + 1}(\theta\psi - \quad) \tag{39}$$

Noting that all firms are identical and plugging this expression into firm-specific profits yields:

$$\pi_j = \frac{(\theta\psi - \quad)^2}{(N\psi + 1)^2}\frac{1}{-} \tag{40}$$

With free entry, profits must equal the fixed cost of entry $F\psi$ This implies the total number of firms in equilibrium N^* is equal to:

$$N^* = \frac{\theta\psi -}{\sqrt{F\psi}} - 1 \tag{41}$$

Given all firms are identical with equal market shares, the HHI in this case is simply the inverse of the total number of firms N^*. The wage markdown, on the other hand, is given by:

$$\frac{\theta\psi - w}{w} = \frac{\sqrt{F\psi}}{\sqrt{F\psi} +} \tag{42}$$

In this model, if variation in concentration is driven by differences in fixed costs F, then variation in concentration across markets will be reflected in different wage markdowns across markets. However, if variation is driven solely by differences in θ, then markets will have different levels of concentration, different wage levels, but identical monopsony power.

For example, assume a trade shock reduces the value of marginal product, implying a lower θ. Then N^* will decreases implying concentration increases. The wage markdown will remain exactly the same, as it is a function of F, and , and none of these parameters have changed. Therefore, to maintain equality, wages must also fall. Therefore, reductions in will simultaneously increase concentration and lower wages.

C.5 Wage Bargaining Model

This section illustrate a model of wage bargaining following Abowd and Lemieux (1993) and He (2018). The key difference in this model is that increases in product market power will tend to increase wages.

To begin, consider a group of $\bar{l}_j$ workers bargaining over both wages and employment level with firm j. The workers seek to maximize $l_j w_j + (\bar{l}_j - l_j)v$, where w_j is the bargained wage, l_j is the employment level, and $v\psi$ is the value of the outside option to the workers. In this case, I assume workers who do not obtain employment reenter the labor force and search for a new job. Therefore, the value of the outside option is equal to the expected wage of the new job minus any search costs

$c\psi$associated with finding a new job.

The workers bargain with a firm that has a profit function $p_j(F(l_j))F(l_j) - w_j l_j$. The threat point for workers is the value of the workers' outside option, while the threat point for the firm is zero profits. The bargaining solution chooses l_j and w_j to maximize:

$$\max_{l_j, w_j} [l_j w_j + (\bar{l}\psi - l_j)v\psi - \bar{l}v]^{\ j} [p_j(F(l_j))F(l_j) - w_j l_j]^{1-\ j} \tag{43}$$

Taking the first order conditions for the bargaining problem yields the following two optimality conditions:

$$w_j = \ _j \left(\frac{p_j(F(l_j))F(l_j)}{l_j} - v\psi \right) + v\psi \tag{44}$$

$$F'(l_j)p_j(F(l_j)) \left(\frac{1}{\varepsilon_j \psi} + 1 \right) = v\psi \tag{45}$$

The key difference in this model is that wages depend on three parameters: the bargaining parameter $_j$, the value of workers outside option v, and the revenue per worker, $\frac{p_j(F(l_j))F(l_j)}{l_j}$. Firms with higher revenue per worker, all else equal, will have higher earnings. Therefore, while increases in product market power may decrease the size of the firm, it may raise the average revenue per worker, which leads to higher earnings for incumbent workers.

Appendix D: Comparisons Between Flows-Adjusted Concentration and HHI

In this section I discuss how the flows-adjusted concentration measure $C\psi$and a standard $HHI\psi$ compare. Both measures are computed at the 4-digit NAICS by commuting zone level. However, the flows-adjusted concentration measure takes into account flows out of the industry. The two measures will tend to diverge when cross-industry mobility is high.

In Appendix Table A7, I report the average (employment-weighted) concentration level for different aggregated sectors and then rank them from least to most concentrated. Panel A measures concentration using the flows-adjusted concentration measure while Panel B uses the standard $HHI\psi$ measured at the 4-digit NAICS by commuting zone level.

As can be seen in Appendix Table A7, the first clear difference is that the levels are much lower for the flows-adjusted concentration measure. This is because, in general, many transitions between jobs are not within the same 4-digit NAICS code, with 76 percent of all job transitions occurring between 4-digit NAICS codes. Therefore, incorporating this information drastically reduces the level of local labor market concentration.

However, the rankings across industries are roughly similar across the two measures of local labor market concentration. For example, the construction industry is the least concentrated according to both measures while utilities is the most concentrated according to both measures. Many of the other industries receive the same ranking according to both measures. A regression of the rank according to $C\psi$on the rank according to $HHI\psi$yields a coefficient of 0.9 with an R squared of 0.82.

However, there are a few industries in which the metric of concentration seems to matter a great deal. Finance, for example, is ranked the 14^{th} least concentrated according to flows-adjusted C, but 10^{th} according to HHI. Similarly, mining is ranked 18^{th} least concentrated according to flows-adjusted C, but 14^{th} according to HHI. Management of businesses is ranked 5^{th} least concentrated according to C, but 9^{th} least according to HHI.

The reason the concentration measures differ for these industries is because they tend to have the most extreme mobility patterns (either higher than average within-NAICS transition rates or lower than average within-NAICS transitions rates). To see this, Appendix Table A8 reports the probability a job transition is within the same 4-digit NAICS code for the same broad industry groupings as in Appendix Table A7.

As can be seen from the table, the industries that are more concentrated under the flows-adjusted concentration measure $C\psi$(e.g. mining and finance) also have the highest within-industry transition rates. Industries that are less concentrated according to the flows-adjusted concentration measure $C\psi$(e.g. management of business) have the lowest within-industry transition rates. The transition rates do vary quite a bit across industries, with a minimum of 9.2 percent and a maximum of 34.7 percent.

Another important factor that impacts differences between the flows-adjusted concentration measure $C\psi$and the HHI is the size of the market. Intuitively, some definitions of industries are very specific while others are quite broad. Offices of physicians (NAICS code 6211), for example, is relatively broad and likely encapsulates many different establishments. Sheep and goat farming (NAICS code 1124) is clearly quite specific and a relatively small industry. This will of course impact concentration if standard industry by commuting zone definitions are used. The sheep and goat farming industry will be mechanically quite concentrated due to the industry being relatively small.

The flows-adjusted concentration measure, however, takes this into account by adjusting for the fact that many flows may be to other industries. To see how this effects concentration measurement in practice, Appendix Table A9 regresses the log of different concentration measures on log employment to see how size relates to measured concentration.

For a standard HHI measured at the commuting zone-by-industry level, a 1 log point increase in employment is associated with a -0.28 log point decline in concentration. Larger markets tend to be less concentrated. The R^2 of this regression is 0.317, indicating that employment alone explains a substantial portion of the variation in concentration across markets. In column 2, I find that for the flows-adjusted concentration measure, a 1 log point increase in employment is associated with a -0.04 log point decline in concentration. Additionally, employment explains very little of the variation in concentration across markets, with an R^2 of 0.004. Intuitively, there is no mechanical relationship between market size and concentration according to $C\psi$because $C\psi$adjusts for flows out of the industry.

ATTACHMENT #3

California Nurses Association, Supplemental Comments

to the California Law Revision Commission

Antitrust Law - Study B-750, Mergers and Acquisitions

Fulton B, Arnold D, King J, Montague A, Greaney T, and Scheffler R (Nov. 2022), "The Rise of Cross-Market Hospital Systems and Their Market Power in the US," *Health Affairs*, 41(11): 1652-60, https://www.healthaffairs.org/doi/10.1377/hlthaff.2022.00337.

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The Rise Of Cross-Market Hospital Systems And Their Market Power In The US

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ABSTRACT Although hospital consolidation within markets has been well documented, consolidation across markets has not, even though economic theory predicts—and evidence is emerging—that cross-market hospital systems raise prices by exerting market power across markets when negotiating with common customers (primarily insurers). This study analyzes hospital systems using the American Hospital Association Annual Survey Database and defines hospital geographic markets as commuting zones that link workers to places of employment. The share of community hospitals in the US that were part of hospital systems increased from 10 percent in 1970 to 67 percent in 2019, resulting in 3,436 hospitals within 368 systems in 2019. Of these systems, 216 (59 percent) owned hospitals in multiple commuting zones, in part because 55 percent of the 1,500 hospitals targeted for a merger or acquisition between 2010 and 2019 were located in a different commuting zone than the acquirer. Based on market-power differences among hospitals in systems, the number of systems in urban commuting zones that could potentially exert enhanced cross-market power increased from thirty-seven systems in 2009 to fifty-seven systems in 2019, an increase of 54 percent. The increase in cross-market hospital systems warrants concern and scrutiny because of the potential anticompetitive impact of hospital systems exerting market power across markets in negotiations with common customers.

Health care delivery in the US has evolved into a patchwork of health systems via mergers and acquisitions, leading to systems that have grown substantially in number, size, and geographic scope during the past several decades.[1,2] Although hospital consolidation within local geographic markets has occasionally been associated with moderate cost savings,[3] it is consistently associated with higher prices and either the same or lower quality.[4–10] Scholars and antitrust enforcers have focused significant attention on the anticompetitive impacts of within-market consolidation, but less is known about consolidation that crosses geographic markets. Notwithstanding, emerging empirical evidence grounded in economic theory has revealed the potential for anticompetitive effects from cross-market hospital mergers.[11–13]

A hospital merger is considered to cross markets when the merging hospitals do not compete for the same patients, either because of geography (for example, the merging hospitals are located in distinct hospital service areas) or because of services (for example, their service lines do not overlap); the former is the focus of our study. However, insurers are the primary payers for hospital services for enrollees in multiple

geographic markets who need different hospital services, so the competitive impact of a merger that crosses markets may be different for insurers than for patients, which can be illustrated by showing the demand for hospital services in stages.[14] In the first stage, insurers and hospitals negotiate prices, resulting in insurers forming hospital networks that are included in the benefit design of the health plans offered to employers. In the second stage, employers negotiate with the insurers to determine which health plans to offer to their employees, who, in the third stage, select a health plan from those being offered by their employers. In the fourth stage, patients requiring hospital care select a hospital in a particular geographic market, defined variously as a hospital service area, a Metropolitan Statistical Area, or a hospital referral region. Thus, because large insurers need hospital networks across markets, they become common customers across those markets, potentially enabling cross-market hospital systems to exert market power across the markets (hereafter "cross-market power") when negotiating contracts (including bargaining about prices) with such common customers.

Cross-market hospital systems may extract surplus via higher prices based on several theories, including two theories on how cross-market hospital systems leverage their hospitals across markets in contract negotiations with insurers[11,12,15,16] and a third theory on how cross-market systems compete among themselves.[13,17,18] First, the hospital system can tie its hospitals, requiring insurers that are contracting with a particular hospital in the system (the "tying" hospital) to also contract with another hospital in the system (the "tied" hospital)—and, in the extreme, the system can tie all of its hospitals, known as all-or-nothing contracting. Tying enables the system to extract more surplus (for example, via higher prices) from insurers and large employers that are common customers across these markets. Insurers and employers with "holes" in their provider networks (that is, the network lacks at least one major hospital in a particular market) may be at a competitive disadvantage compared with other insurers or employers that have more robust networks, thereby creating market leverage for systems with hospitals across markets. Second, in the absence of tying, cross-market hospital systems can leverage their hospitals across markets when negotiating with common insurers because of their ability to satisfy sizable portions of insurers' hospital network needs. Third, turning to how cross-market firms may compete among themselves, when two firms (for example, hospital systems) compete in multiple markets, known as multimarket contact, this contact can potentially lead to the firms competing less aggressively in a particular market to maintain the status quo in other markets, known as mutual forbearance.[17,18]

Consistent with these theories, evidence is emerging that cross-market systems may enable hospitals to increase prices because of cross-market power, resulting in greater bargaining leverage,[11,12] or because of multimarket contact that leads to mutual forbearance.[13] In 2017 Matthew Lewis and Kevin Pflum found that the prices of target hospitals involved in cross-market mergers increased 17 percent more than nonacquired hospitals, with this difference reaching 29 percent for targets acquired by large systems and 33 percent for small targets being acquired.[12] In 2019 Leemore Dafny and colleagues found that the prices of hospitals (or systems) that made a cross-market hospital acquisition increased 7–10 percent more than those of control hospitals if the acquisition was in state but did not find significant price increases when the acquisition was out of state. The relative price increase of the acquiring hospitals climbed to 31 percent when the acquirer had a below-median market share and the target had an above-median market share, and the relative price increase was 18 percent in the opposite situation, when the acquirer had an above-median market share and the target had a below-median market share.[11] In 2018 Matt Schmitt examined multimarket contact between hospital systems and payers and found increased contact to be associated with a 6–7 percent increase in hospital prices.[13] Overall, however, little is known about the nature of cross-market hospital systems and mergers, even though Dafny and colleagues' analysis of 528 general acute care hospital mergers during the period 2000–12 found that 272 (or 51.5 percent) of the mergers involved hospitals located in different core-based statistical areas.[11]

The objectives of this article are fourfold. First, we present our analysis of trends in the share of hospitals that were part of hospital systems during the period 1970–2019. Second, we present our analysis of the mergers and acquisitions that formed these systems, including analyzing the share of hospital mergers that occurred across markets. Third, we define a taxonomy of hospital systems, ranging from those located within a single market to those that were national, and we show how the shares of these systems changed between 2009 and 2019. We also describe their characteristics, including the number of hospitals, market shares, nonprofit versus for-profit status, and rural status. Fourth, we report the number of hospital systems that owned hospitals in markets in which the system had a small mar-

ket share (less than 30 percent) but that also owned hospitals in markets in which the system had a large market share (30 percent or more), which may lead to enhanced cross-market power.[11,12]

These empirical results quantify the number and types of hospital systems operating in multiple markets, thereby informing regulators and health policy analysts about the degree of concern and scrutiny that is warranted.

Study Data And Methods

DATA SOURCE The hospital data used to identify cross-market hospital systems and mergers are from the American Hospital Association (AHA) Annual Survey Database for 2009–19.[19] Our study included all community hospitals, defined as short-term general and specialty hospitals that are available to the public, most of which are privately owned.[20] We adopted the AHA's definition of a multihospital system (hereafter "hospital system") as "two or more hospitals owned, leased, sponsored, or contract managed by a central organization" (hereafter "owned").[20] For details on the hospital sample and the methods for counting hospitals in hospital systems, see online appendix section I.[21]

ANALYSIS To measure the geographic breadth of hospital systems, we analyzed how they span commuting zones, which link workers to places of employment based on commuting surveys, including workers commuting from rural to urban areas.[22] The commuting zones were updated as of 2010, resulting in 625 zones that span the US, ranging in size from one county up to a cluster of twenty counties (based on our own analysis).[23,24] Commuting zones have been used to define hospital markets because labor markets are a potential proxy for patients' willingness to travel for hospital services.[25,26] And unlike Metropolitan Statistical Areas, commuting zones capture the connectivity of rural areas with larger hubs of economic activity.

Hospital systems that owned hospitals in only one commuting zone were categorized as "commuting zone systems." Systems that owned hospitals in multiple commuting zones were considered to be cross-market systems, which were categorized based on the geographic breadth of the commuting zones that they owned hospitals in, ranging from being located in one state ("state system"), one census division ("census division system"), one census region ("census region system"), or multiple census regions ("national system") (for details, see appendix section III).[21]

Hospital mergers and acquisitions were identified by examining whether the hospital's system identifier changed between two AHA surveys. If an independent hospital gained a hospital system identifier or if a hospital's system identifier changed to another preexisting identifier, it was considered to be acquired (for details, see appendix section II).[21] The location of the target hospital was classified relative to the acquiring hospital as being in the same commuting zone, the same state (but a different commuting zone), the same census division (but a different state), the same census region (but a different census division), or a different census region. If a hospital system was the target of an acquisition, each hospital was paired with the hospital within the acquirer's system that was closest, as defined by the geographic hierarchy above; therefore, hospital targets within a system for a particular acquisition could be classified differently, depending on their location relative to the acquiring system's hospitals.

Prior studies found heterogeneous cross-market price effects, with prices increasing more when a cross-market merger involved hospitals with significantly different market shares across the markets in which they owned hospitals.[11,12] Other market factors may produce heterogeneous effects, but in this analysis we extended those studies by focusing on hospital systems (not hospital mergers) to analyze market-share differences within hospital systems across the markets in which they owned hospitals because of the concern that systems tie hospitals when negotiating prices with insurers.

We defined a hospital's market share, calculated yearly, as its share of inpatient admissions within a commuting zone. A hospital system's market share is the sum of the market shares of hospitals that it owns within a commuting zone.

We created a variable at the hospital level that indicates whether an insurer was potentially vulnerable to the cross-market power of a hospital system arising from tying, which we defined as "enhanced" cross-market power if the following criteria were met: The hospital was part of a system that owned hospitals in two or more commuting zones; both the hospital and the system it was part of had less than 30 percent market share in the hospital's commuting zone; and in at least one other commuting zone, the system had market power, defined as greater than or equal to either 30 percent or 50 percent market share—thresholds found in antitrust analyses and precedents.[27–30] For an illustration of the potential for a hospital system to exert enhanced cross-market power, see appendix section IV, exhibit A2.[21]

This analysis included only hospitals that were located in one of the 150 urban commuting zones that contained at least one county with 200,000

Given that more than half of all hospital mergers during 2010–19 qualified as cross-market, this trend is worthy of investigation into its effects on market competition.

or more people in 2010. The 200,000-person threshold was used instead of the conventional 50,000-person threshold defining urban counties because cross-market power is less likely to originate in small markets, and a lower population threshold resulted in many more hospitals within systems with a high (30 percent or more) market share. From this hospital indicator variable, we calculated the change in the number of hospitals between 2009 and 2019 that could potentially use cross-market power with insurers, enhanced by market share differentials.

LIMITATIONS This study had a few limitations. First, the AHA Annual Survey Database includes a main file containing information on all hospitals, such as the number of beds and inpatient admissions. It also includes a "units" file, wherein a unit is a separately identified site of care that is a part of a larger (or parent) hospital that is in the main file. Some units are in separate locations from the parent hospital, whereas others might be located within the parent hospital (for example, a specialty unit on a floor of the parent hospital). Either way, the parent hospital incorporates the unit's measures into its survey responses, but this occurs only at an aggregate level; the unit's information is not separately reported. The AHA does not include units as separate hospitals in its reporting,[20] and it was beyond the scope of this study to determine the share that were stand-alone hospitals. In the appendix we incorporated the "units" data to estimate (assuming that all units were stand-alone hospitals) that we underreported the number of hospitals in systems in 2019 by at most 16 percent (see appendix section I) and underreported the number of hospitals that were targeted for mergers during the period 2010–19 by at most 4 percent (see appendix section II).[21]

Second, although commuting zones are analytically attractive because they span the US and are based on commuting patterns that serve as a proxy for willingness to travel for hospital services, they do not necessarily represent hospital markets, which are more precisely defined using option demand markets.[31] To use that approach, however, one needs consumer-level information because it is based on consumers' willingness to pay to include a hospital within a health plan's network before knowing their health care needs. Yet, in most cases, using commuting zones to define markets resulted in a conservative estimate of the number of cross-market hospital mergers compared with other studies that used narrower market definitions, such as a twenty-mile radius,[13] a thirty-minute drive time,[11] or Metropolitan Statistical Areas.[32]

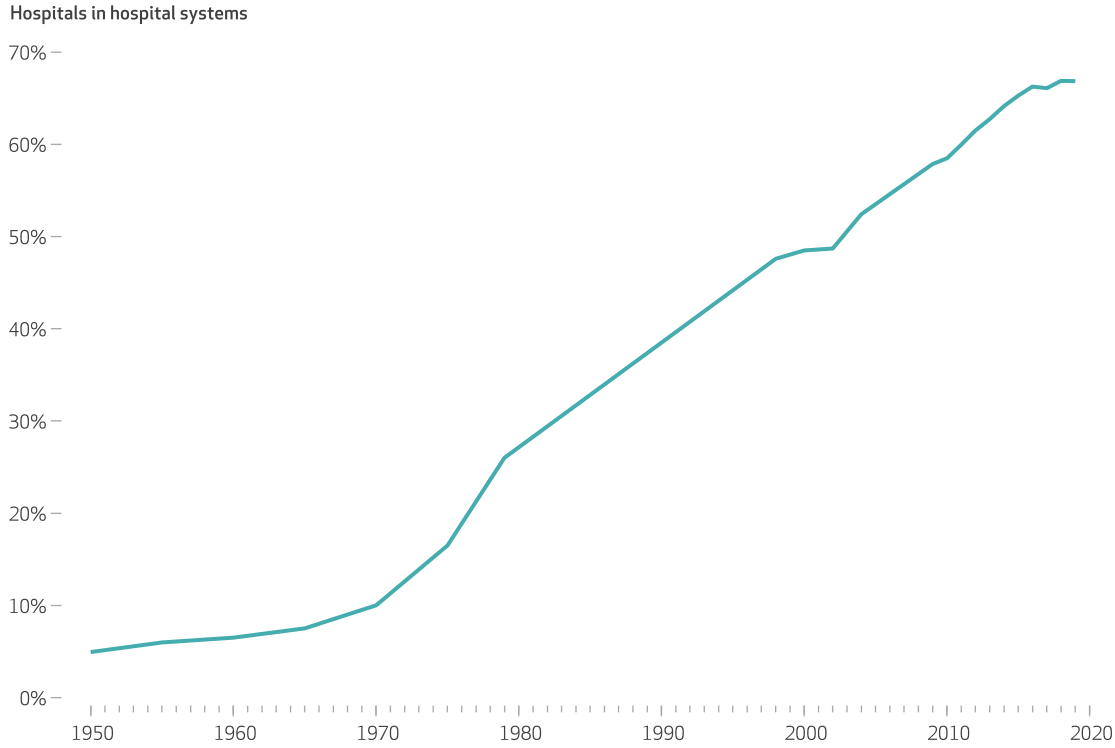
Study Results

The share of hospitals that are part of hospital systems has been significantly increasing since the 1970s, rising from 10 percent in 1970 to 67 percent in 2019 (exhibit 1). By 2019, 3,436 (67 percent) of the 5,141 community hospitals in the US were part of 368 hospital systems, but this percentage differed between for-profit (79 percent) and nonprofit (63 percent) hospitals and between urban (74 percent) and rural (56 percent) hospitals (data not shown). In 2019 hospital systems comprised nine hospitals, on average, and most systems were relatively small, with 292 systems (79 percent) comprising ten or fewer hospitals (appendix exhibit A3).[21] However, the seventy-six largest systems—those with eleven or more hospitals—comprised 2,217 hospitals, or 65 percent of all hospitals within systems. Within a commuting zone, independent hospitals' average market share of admissions was 13 percent, whereas the average market share of hospital systems was 23 percent.

During the period 2010–19, 1,500 hospitals were acquired by or merged with a hospital or system, with most years in the range of 140–160 hospitals (exhibit 2). Of those 1,500 hospitals, 45 percent were located in the same commuting zone as the acquiring hospital or system, and the remaining 55 percent were located in different commuting zones. This 55 percent share was fairly stable during the period; in most years the share varied between 45 and 60 percent. To make the same comparison at the state level, of the 1,500 hospitals, 21 percent were located in a different state as the acquiring hospital or system, with this share trending higher from 2014 to 2018, at which point it reached 39 percent.

EXHIBIT 1

Share of US hospitals in hospital systems, 1950–2019



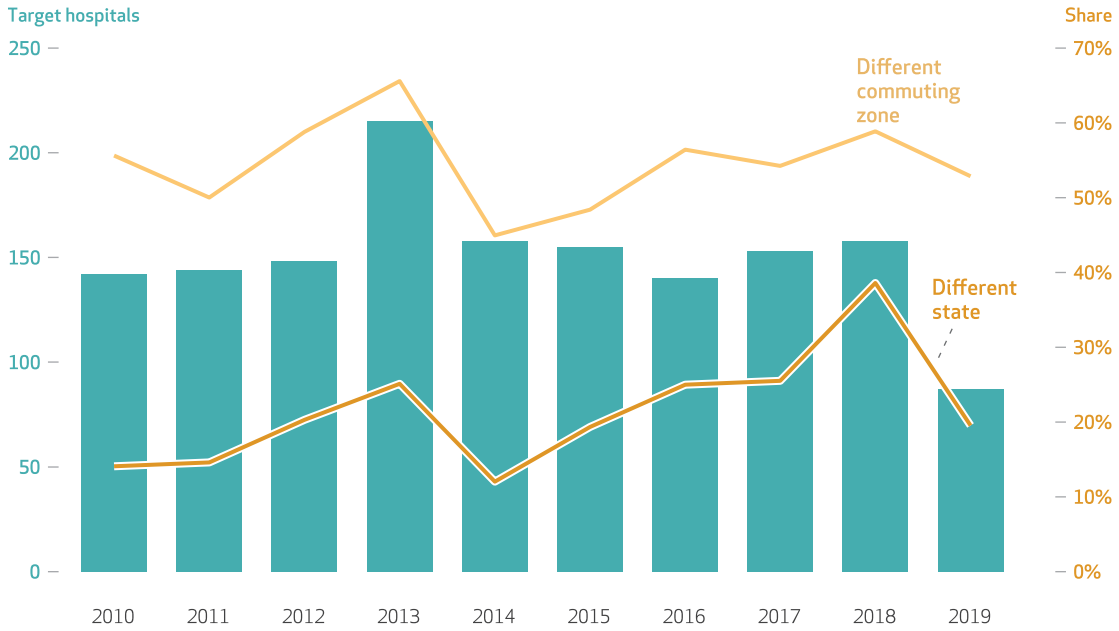
SOURCES For 1950–79: Alexander JA, Amburgey TL. The dynamics of change in the American hospital industry: transformation or selection? Med Care Res Rev. 1987;44(2):279–321. For the basis for the linear increase between 1980 and 1997: Succi MJ. The effects of hierarchical inter-organizational relationships on organizational performance [doctoral dissertation]. Ann Arbor (MI): University of Michigan; 1996. For 1998–2004: Bazzoli GJ. Hospital consolidation and integration activity in the United States. In: Blank JLT, Vladmanis VG, editors. Evaluating hospital policy and performance: contributions from hospital policy and productivity research. Bingley (UK): Emerald Group Publishing Limited; 2008. p. 45–61. For 2009–19, authors' analysis of data from the American Hospital Association Annual Survey Database (see note 19 in text). **NOTES** For the period 1950–79 the shares were based on all nonfederal hospitals, and for the period 1980–2019 the shares were based on all community hospitals. No yearly data were available for the period 1980–97, so we assumed a linear increase, based on the mean being 37 percent for 1984–91. No data were available for 2005–8, so we also assumed a linear increase during this period.

On the basis of these mergers and acquisitions, the share of hospitals that were part of a hospital system increased from 58 percent in 2009 to 67 percent in 2019 (exhibit 3). Most of the increase occurred in the share of hospitals that were part of state systems, increasing from 9 percent to 13 percent of hospitals, and part of census division systems, increasing from 6 percent to 9 percent of hospitals. The share of systems that were cross-market systems increased from 53 percent in 2009 to 59 percent in 2019, with most of the increase being in state systems, whose share increased from 22 percent to 29 percent of systems. The geographic breadth of the five largest hospital systems and the growth of three large hospital systems are illustrated in a series of maps on a website created by the authors.[33]

In 2019 hospital systems differed significantly across the five geographic categories (exhibit 4). The geographically broad systems included more hospitals than did systems with narrow geographic reach. The fifty national systems included an average of 33.1 hospitals per system, whereas the other system types included averages of 3.2–11.3 hospitals per system. The national systems were mostly for profit (54 percent), with Medicaid enrollees making up a relatively small share of inpatient days (17 percent), and they usually included diverse types of hospitals, with 72 percent including a specialty hospital, 62 percent including a critical access hospital, and 54 percent including a rural hospital. In contrast, of the 152 commuting zone systems, only 9 percent were for profit, with a 24 percent Medicaid share, and only 26 percent included a specialty hospital, 26 percent included a critical access hospital, and 14 percent included a rural hospital. Appendix exhibit A4 reports hospital-level information about hospital systems (panel A) and also shows that systems owned hospitals in an average of 4.7 commuting zones, but the

EXHIBIT 2

Number of target hospitals acquired or merged within and across markets in the US, 2010–19



SOURCE Authors' analysis of data from the American Hospital Association (AHA) Annual Survey Database for 2009–19 (see note 19 in text). **NOTES** The total number of target hospitals that were acquired or merged from 2010 to 2019 was 1,500, of which 1,332 were general medical and surgical hospitals. Hospital mergers and acquisitions were identified by examining whether the hospital's system identifier changed between two AHA surveys; hence, the 2009 survey was needed to identify mergers in 2010.

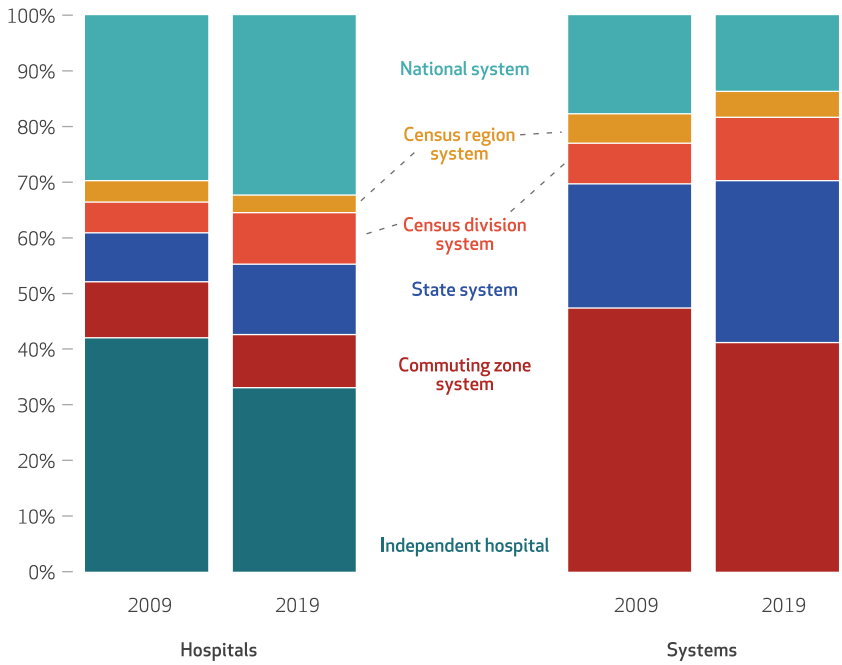
mean was 19.0 for national systems (panel C).[21] The commuting zones in which a system owned hospitals were often located in adjacent zones or clusters.

We calculated the number of hospitals in urban commuting zones that could potentially benefit from enhanced cross-market power, stemming from being part of a system that had a dominant market share in another urban commuting zone (appendix exhibit A5, panel A).[21] For example, if 30 percent is the minimum market share needed to exert enhanced cross-market power, then the number of hospital systems in urban commuting zones that could make an insurer vulnerable to enhanced cross-market power increased from thirty-seven to fifty-seven systems (or 54 percent) from 2009 to 2019. The fifty-seven systems comprised an average of ten hospitals and were composed of twenty-one state systems, fourteen census division systems, four census region systems, and eighteen national systems (data not shown). Hence, the number of hospitals in urban commuting zones that could potentially benefit from enhanced cross-market power also increased from 460 to 588 (or 128 more hospitals) during this period, resulting in the share of these hospitals increasing from 15.6 percent to 19.0 percent.

Next, we extended our measure to estimate

EXHIBIT 3

Distribution of US hospitals and hospital systems by geographic, cross-market breadth, 2009 and 2019



SOURCE Authors' analysis of data from the American Hospital Association Annual Survey Database for 2009–19 (see note 19 in text). **NOTES** Percentages might not sum to 100% because of rounding. The nine census divisions are contained in four census regions. The total number of hospitals was 5,008 in 2009 and 5,141 in 2019; the total number of systems was 358 in 2009 and 368 in 2019.

EXHIBIT 4

Description of US hospital systems, by geographic, cross-market breadth, 2019

	Systems					
Hospital system–level measures	**All**	**Commuting zone**	**State**	**Census division**	**Census region**	**National**
No. of hospital systems	368	152	107	42	17	50
No. of hospitals per system (mean)	9.3	3.2	6.1	11.3	9.6	33.1
No. of hospital beds per system (mean)	1,626	814	1,279	1,898	1,292	4,722
Systems that are cross-market (commuting zone) (%)	59	0	100	100	100	100
Systems that are for profit[a] (%)	13	9	2	12	6	54
Systems that include an academic medical center[b] (%)	37	34	41	48	35	26
Systems that include a specialty hospital (%)	31	26	24	26	18	72
Systems that include a critical access hospital (%)	45	26	50	64	94	62
Systems that include a rural hospital[c] (%)	36	14	48	52	71	54
Systems that are an AHRQ health system (%)	80	77	92	86	88	58
Hospital system shares (%)						
Market share across commuting zones[d]	23	25	30	27	26	19
Medicare share of inpatient days (mean)	49	49	48	48	48	55
Medicaid share of inpatient days (mean)	23	24	24	22	24	17

SOURCE Authors' analysis of data from the American Hospital Association Annual Survey Database for 2019 (see note 19 in text). **NOTE** AHRQ is Agency for Healthcare Research and Quality. [a]For most of the 368 hospital systems, all of a system's hospitals were either for profit (22 systems) or nonprofit (291 systems), and the system was designated as such. (Non–federal government hospitals within a system were coded as nonprofit; no federal government hospitals are community hospitals.) For systems that had both for-profit and nonprofit hospitals, the system was designated for profit if 50 percent or more of its hospitals were for profit. [b]Academic medical centers include major teaching hospitals, which the American Hospital Association defined as all hospitals that have the Council of Teaching Hospitals designation. [c]Located in a county with a population of less than 50,000. [d]Each system's market share in a commuting zone was calculated using admissions. If a system operated in more than one commuting zone, its overall market share was the simple average of its market shares across commuting zones. For each type of system based on geographic breadth, the market share reported in the exhibit was the simple average market share of the systems in each system type.

heterogeneity in potential cross-market power. For each of the 588 hospitals in 2019 that had less than 30 percent market share that were owned by a system that had both less than 30 percent total market share in the hospital's market and 30 percent or more market share in at least one other commuting zone, we calculated the system's market-share difference between the commuting zone with less than 30 percent market share and the system's highest market share in a commuting zone (appendix exhibit A5, panel B).[21] Appendix exhibit A6 shows the distribution of these 588 market-share differences: The median hospital's market-share difference was 36.7 percentage points (interquartile range: 27.5–48.7).[21] In appendix exhibit A5 (panel C), we report the number of commuting zones that the cross-market power originated from, to account for whether a hospital system had dominance in many versus fewer commuting zones.[21]

Discussion

From 1970 to 2019 the percentage of hospitals that were part of hospital systems rose substantially, from 10 percent to 67 percent, including a moderate increase from 58 percent to 67 percent between 2009 and 2019. Although the absolute number of hospital systems remained fairly constant during this latter period, increasing from 358 to 368, their size and geographical breadth expanded. From 2010 to 2019, 1,500 hospitals were targets of a merger or acquisition, with 55 percent being located in a different commuting zone than the acquiring hospital or system, resulting in 216 systems (59 percent) owning hospitals in more than one commuting zone by 2019. These mergers and acquisitions increased the share of systems that were cross-market systems—either state, census division, census region, or national systems—from 53 percent to 59 percent. In addition, many of these systems may have possessed enhanced cross-market power because of tying hospitals with differential market shares in price negotiations with insurers. Based on market-share thresholds described in this article, the number of hospital systems in urban commuting zones that could potentially exert enhanced cross-market power increased from thirty-seven to fifty-seven systems (or 54 percent) from 2009 to 2019.

Our results are consistent with those of other studies that examined the growth of hospital systems.[2,5] In addition, our results are consistent with those of another study[11] that found that 51.5 percent of the 528 general acute care hospital mergers that were analyzed during 2000–12

were across markets, similar to the 55.1 percent share we found with more recent data, showing that this trend has continued.

Given that more than half of all hospital mergers during 2010–19 qualified as cross-market, this trend is worthy of investigation into its effects on market competition. Yet none of these mergers was challenged on cross-market grounds because the pervading view is that these entities did not compete in the same product and geographic markets, and therefore, these mergers could not be anticompetitive.[34] However, evidence is accumulating that cross-market mergers may sometimes enable hospital systems to increase prices through cross-market power, such as from tying hospitals across markets that have common customers (primarily insurers) [11,12,35] or because of multimarket contact that leads to mutual forbearance.[13]

However, in one instance occurring after our period of analysis, antitrust enforcers took notice. In 2020 the California attorney general became the first antitrust enforcer to intervene in a proposed health system affiliation on cross-market grounds, imposing competitive-impact conditions on the cross-market affiliation between Cedars-Sinai Health System and Huntington Memorial Hospital in Southern California before permitting the affiliation to move forward.[36] The California attorney general imposed conditions based on analyzing health care markets in Southern California, economic evidence of price trends after cross-market hospital mergers, and the market power and pricing patterns of Cedars-Sinai and Huntington Memorial. As a result, he prohibited the affiliated system from imposing certain terms in their contracts with insurers, including all-or-nothing clauses that would require payers to contract with both Cedars-Sinai and Huntington Memorial and antitiering and antisteering clauses that would prevent insurers from steering patients away from these entities. He also imposed a limit on the amount that Huntington Memorial Hospital's prices can increase each year. The provider organizations filed suit in Los Angeles Superior Court to challenge the conditions as overly burdensome and "unprecedented," and the case was settled between the parties with minor adjustments to the competitive-impact conditions.[37]

Despite this initial victory, identifying the best path forward for antitrust enforcement governing cross-market health care mergers is fraught with challenges.[38–41] Untangling cross-market anticompetitive mechanisms in a premerger environment is difficult without greater understanding of the competitive dynamics of contracting with large cross-market health systems. First, economic theory is not conclusive on which, if any, cross-market mergers will be anticompetitive, particularly if they have cognizable efficiencies or are viewed as complements by purchasers. Second, mergers and acquisitions of large health systems that provide care across geographic and product markets do not easily fit into traditional antitrust frameworks for analyzing horizontal or vertical transactions that require specific analyses of narrow product and geographic markets. However, the growing prevalence of cross-market hospital mergers accompanied by empirical evidence that such mergers are associated with price increases demands further investigation by economists, legal scholars, and antitrust enforcers to determine the circumstances in which cross-market mergers can harm competition in health care markets. ■

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NOTES

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ATTACHMENT #4

California Nurses Association, Supplemental Comments

to the California Law Revision Commission

Antitrust Law - Study B-750, Mergers and Acquisitions

Hafiz H and Marinescu I (2023), "Labor Market Regulation and Worker Power," *University of Chicago Law Review*, Vol. 90(2): 469-509, https://chicagounbound.uchicago.edu/uclrev/vol90/iss2/6/.

Due to a lack of competition among employers in the labor market, employers have monopsony power, or power to pay workers less than what the workers contribute to the employers' bottom line. "Worker power" is workers' ability to obtain higher wages and better working conditions. While the antitrust agencies have just begun developing policy and enforcement strategies to regulate employer monopsony, broader government policies that impact market forces, the formation of labor market institutions, and workers' voices and exit options also play a defining role in shaping worker power relative to employers. For example, in addition to antitrust enforcement, worker power can be enhanced by labor agencies' regulation of employer/employee status, wage and working condition floors, and workers' collective action. Worker power can also be enhanced by agencies administering social safety net protections and influencing labor market tightness through monetary policy.

Scholars have yet to assess how federal agencies, whose statutory authority and regulatory purview impact worker power, could best direct their authority, regulatory tools, and expertise towards labor market regulation in the presence of employer monopsony power. This Essay outlines the comparative advantages of federal agencies' regulations impacting worker power. It then develops a checklist of worker power indicators for agencies to track and operationalize in high-priority policy and enforcement areas and offers a broader worker power agenda through a whole-of-government approach involving interagency coordination to protect and strengthen workers' voice and exit options.

INTRODUCTION

Worker power has declined relative to employer power due to market forces, insufficient regulation, and weak labor market institutions. On the employer side, labor market concentration as well as employer monopsony, anticompetitive conduct, and workplace restructuring, contribute to eroding worker power, reducing employment and worker compensation. Low union density, weak

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labor and employment law protections, and underenforcement limit workers' countervailing power further.

A couple examples are illustrative. First, fast-food workers are some of the lowest paid workers in our economy and suffer rampant wage theft and poor working conditions.[1] Their Fight for $15 campaign to raise minimum wage laws around the country instigated a national conversation on the need to lift wage floors.[2] But workers faced an uphill battle in negotiating better wages and working conditions with franchisors because labor and employment law does not extend legal duties to upstream firms in "fissured" industries like franchising.[3] Workplace fissuring was allowed by antitrust law's leniency regarding the lawfulness of vertical restraints, allowing firms to vertically disintegrate while retaining significant control over downstream workforces.[4] Further, fast-food employers have used no-poach and noncompete agreements to limit low-wage workers' outside options.[5] This limited labor and antitrust regulation overlays a deeper network of rights allocations that favors employer power relative to worker power, including at-will default rules in employment contracting and limited support for workers, especially workers of color, if

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[1] *See, e.g.*, *Company Wage Tracker*, ECON. POL'Y INST., https://perma.cc/MMX8-5STT (last updated Apr. 2022); Tiffany Hsu, *Nearly 90% of Fast-Food Workers Allege Wage Theft, Survey Finds*, L.A. TIMES (Apr. 1, 2014), https://perma.cc/Q39A-8WT5; Kiara Alfonseca, *Restaurant Workers Protest Poor Working Conditions and Low Wages at McDonald's, Chipotle, and More Amid Coronavirus Pandemic*, ABC NEWS (May 11, 2021), https://perma.cc/TY7B-8LJV.

[2] *See, e.g.*, Kate Andrias, *The New Labor Law*, 126 YALE L.J. 2, 47–57 (2016).

[3] DAVID WEIL, THE FISSURED WORKPLACE 183–213 (2014); *see also* Hiba Hafiz, *Structural Labor Rights*, 119 MICH. L. REV. 651, 657–59 (2021) [hereinafter Hafiz, *Structural Labor Rights*] (discussing NLRB's joint-employer action against McDonald's); Hiba Hafiz, *The Brand Defense*, 43 BERKELEY J. EMP. & LABOR L. 1, 7–9, 47–50 (2022) [hereinafter Hafiz, *Brand Defense*] (same).

[4] Hafiz, *Brand Defense*, *supra* note 3, at 32–42; Brian Callaci, *Control Without Responsibility: The Legal Creation of Franchising 1960-1980*, 22 ENTER. & SOC'Y: INT'L J. BUS. HIST. 156, 160–69 (2020); Brian Callaci, Sérgio Pinto, Marshall Steinbaum & Matt Walsh, *Vertical Restraints and Labor Markets in Franchised Industries*, SSRN 22 (July 6, 2022), https://perma.cc/V9RP-6MVB.

[5] Alan B. Krueger & Orley Ashenfelter, *Theory and Evidence on Employer Collusion in the Franchise Sector* 17–20 (Nat'l Bureau of Econ. Rsch., Working Paper No. 24831, 2018); ALAN B. KRUEGER & ERIC A. POSNER, A PROPOSAL FOR PROTECTING LOW-INCOME WORKERS FROM MONOPSONY AND COLLUSION 6–9 (Hamilton Project, Proposal No. 2018-05, 2018).

they quit, including limited protections to account for scarce personal wealth, such as social insurance and unemployment insurance.[6]

Worker power is weak relative to employer power even in labor markets with scarcer, high-skilled, and unionized workers. Registered nurses have suffered lower wages from hospital consolidation, employer wage-fixing and information-sharing schemes, as well as labor and employment law violations as they have unionized and struck to improve their benefits and workplace safety and health protections.[7]

Because a range of policies can reinforce or weaken worker power, taking a systematic regulatory approach is necessary. And we have a rare window of opportunity to effectuate one. The Biden Administration has stated that an all-agencies-on-deck approach is required to strengthen worker power, issuing an Executive Order on Promoting Competition in the American Economy that mandates a "whole-of-government" program to combat labor market concentration and employer market power abuses.[8] Pursuant to that objective, the Treasury Department has issued a Report on "The State of Labor Market Competition," proposing government-wide initiatives and policies to "bolster labor market competition and increase workers' bargaining power."[9] And the antitrust agencies have signed memoranda of understanding with the Department of Labor and National Labor Relations Board to coordinate on "protecting competition in labor markets and promoting the welfare of American workers."[10]

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[6] *See* IOANA MARINESCU & JAKE ROSENFELD, WORKER POWER AND ECONOMIC MOBILITY 6–12 (Urban Inst., 2022).

[7] *See, e.g.*, Elena Prager & Matt Schmitt, *Employer Consolidation and Wages: Evidence from Hospitals*, 111 AM. ECON. REV. 397, 406–15 (2021); Jeff Miles, *The Nursing Shortage, Wage-Information Sharing Among Competing Hospitals, and the Antitrust Laws: The Nurse Wages Antitrust Litigation*, 7 HOUS. J. HEALTH L. & POL'Y 305, 328–74 (2007); Michael Sainato, *"We Went From Heroes to Zeroes": US Nurses Strike Over Work Conditions*, THE GUARDIAN (July 30, 2021), https://perma.cc/VXT9-9PDJ; Hailey Mensik, *Nursing Union Says Hospitals Aren't Following OSHA Standard Amid Delta*, HEALTHCARE DIVE (Sept. 28, 2021), https://perma.cc/LG8H-Z76Q; Vin Gurrieri, *Calif. Hospital Can't Bar Union Pins or Badges, NLRB Says*, LAW360 (Apr. 23, 2018), https://perma.cc/763K-KAQE.

[8] Exec. Order No. 14,036, 86 Fed. Reg. 36,987 § 1–2 (July 9, 2021).

[9] *The State of Labor Market Competition*, U.S. DEP'T OF TREASURY 52 (Mar. 7, 2022), https://perma.cc/MM2L-6EEU.

[10] *Memorandum of Understanding Between the U.S. Department of Justice and U.S. Department of Labor*, U.S. DEP'T OF LABOR & U.S. DEP'T OF JUST. 1 (Mar. 10, 2022), https://perma.cc/ERN7-GAHG; *Memorandum of Understanding between the Federal*

Regulatory agencies' "whole-of-government" approach to strengthening worker power would greatly benefit from improved coordination based on a unifying framework identifying indicators of employer and worker power for use in triggering investigations, setting enforcement priorities, and shaping substantive policy. Speaking a common language to overcome obstacles to wide-ranging enforcement can secure more effective outcomes and solidify the bonds between labor market institutions that can buttress worker power.

This Essay proposes such a framework based on a labor-economic model of voice and exit. Voice affects workers' relative bargaining power within the firm while exit gives workers and firms leverage from outside options to the existing employment relationship. When workers have voice and exit options, their wages increase; when they lack such options or when employers limit those options or strengthen their own voice or exit options, worker power decreases. This framework enables us to identify the policy levers that can strengthen or weaken worker and employer power and to locate the regulatory institutions that administer them. But the framework has the added benefit of generating indicators of employer and worker power—a worker power "toolbox"—for interagency transmission and use. The Essay then identifies which policy levers we believe to be the most effective at strengthening worker power and decreasing employer power based on our current empirical knowledge and explains how interagency coordination could better effectuate those policies.

I. SOURCES OF WORKER POWER

Workers' wages and working conditions are determined by their voice and exit options.[11] Voice allows workers to get more out of their *current* employment relationship by striking a better bargain.[12] A prototypical example of voice is unionization. Exit refers to workers' alternatives to any specific job, whether that is taking another job or being without a job.[13] When workers have

Trade Commission (FTC) and the National Labor Relations Board (NLRB) Regarding Information Sharing, Cross-Agency Training, and Outreach in Areas of Common Regulatory Interest, FED. TRADE COMM'N & NAT'L LABOR RELS. BD. (July 19, 2022), https://perma.cc/5KVF-Y8UQ; *Memorandum of Understanding Between the U.S. Dep't of Justice and the National Labor Relations Board*, NAT'L LABOR RELS. BD. & U.S. DEP'T OF JUST. (July 26, 2022), https://perma.cc/PMH2-59QV.

[11] ALBERT O. HIRSCHMAN, EXIT, VOICE, AND LOYALTY 21–43 (1970).

[12] *Id.* at 30–33.

[13] *Id.* at 21–22.

more and better job alternatives, they can either switch to these better options, or obtain better conditions in the current job by credibly threatening to leave. Workers' wages and working conditions are also improved, all other things equal, when firms have worse exit options, meaning that it is more difficult to find a suitable worker, or to eliminate the job completely.

Before describing some of the mechanisms at play, it is important to note that our discussion brackets the question of what the exact balance should be between worker and employer power. The answer to that question depends on both normative judgments and empirical facts: What is the goal of the policy, and what are the best instruments to achieve it? For example, economics typically adopts a utilitarian framework for its normative judgments. In this framework, economic random search theory shows that either worker or employer bargaining power (best thought of as voice) can be too high relative to a utility-maximizing benchmark: worker power that is too high or too low fails to maximize aggregate utility (Hosios condition).[14]

For a while, economists have pushed the idea that any intervention that increases worker power must reduce employment or otherwise harm workers. For example, minimum wages were assumed to always reduce employment as workers get too expensive. But such results are predicated on perfectly competitive markets. With imperfectly competitive labor markets, increases in worker power can increase employment.[15] Empirical evidence is key to determining which policies are best at achieving specific goals.

Search theory provides us with a useful way of thinking about what determines wages and working conditions. Search theory distinguishes itself from traditional supply and demand models of the labor market, which assume that workers can immediately get a job as long as they are willing to accept the market wage. Instead, search theory posits that there are frictions in the labor market, so that workers cannot get a job immediately but must search for a job, with uncertain outcomes. This means that workers take time to find a job and must design a search strategy that will help them find the right job. According to search theory,

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[14] Arthur J. Hosios, *On the Efficiency of Matching and Related Models of Search and Unemployment*, 57 REV. ECON. STUD. 279, 295–96 (1990).

[15] José Azar, Emiliano Huet-Vaughn, Ioana Marinescu, Bledi Taska & Till von Wachter, *Minimum Wage Employment Effects and Labor Market Concentration*, SSRN 19 (July 5, 2019), https://perma.cc/ERW4-6NJV.

wages are determined by worker productivity, worker bargaining power, the worker's outside option as measured by her reservation wage, and the firm's outside option as measured by its reservation profit. Higher worker bargaining power, higher reservation wages, and lower reservation profits all increase wages.[16] Importantly, other theories of imperfectly competitive labor markets—such as monopsonistic competition or job differentiation—have similar wage determinants.[17]

A. Workers' Exit Options

Workers' exit options determine their reservation wage, i.e., the lowest wage they would be willing to accept given their other options. When the reservation wage goes up, actual wages go up. Firms' reservation profits play a similar role: when a firm's reservation profits go down, wages go up. When reservation profits go down, the worker becomes more valuable to the firm relative to the firm's next best option, and, as a result, the firm is willing to pay the worker more (the surplus increases and workers get a share of the surplus).

Many market forces affect workers' exit options. Perhaps most obviously, labor supply and demand matter: wages are higher when labor market tightness is higher, i.e., when there are more jobs relative to the number of workers looking for jobs. Indeed, when labor market tightness is high, workers can find a job more easily, so their reservation wage increases. On the other hand, labor market concentration decreases the number of available employers and tends to lower workers' opportunities, thereby lowering wages.[18] Often, workers are not aware that good job substitutes exist, which lowers their reservation wage. Thus, search costs and a lack of information tend to lower workers' reservation wage. Even when workers are aware that there are some good jobs, the cost of moving can dissuade them from taking these jobs. Distance is a key reason why jobs differ from each other and thus

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[16] Richard Rogerson, Robert Shimer & Randall Wright, *Search-Theoretic Models of the Labor Market*, 43 J. ECON. LITERATURE 959, 959–88, 969 Equation 36 (2005).

[17] We do not take a position here as to which is the most relevant theory overall but instead provide an empirical overview of policies tested under various theories and identify those we understand to most likely increase worker power. *See, e.g.*, Carmen Sanchez Cumming, *Understanding the Economics of Monopsony: How Labor Markets Work Under Imperfect Competition*, WASH. CTR. FOR EQUITABLE GROWTH (Apr. 6, 2022), https://perma.cc/SSE5-R5C2.

[18] José Azar, Ioana Marinescu & Marshall Steinbaum, *Labor Market Concentration*, 2020 J. HUM. RES. 1218-9914R1, 12–18; Prager & Schmitt, *supra* note 7, at 397–427.

allows firms to pay lower wages because they do not compete on an equal footing with firms offering jobs that are farther away from a worker's home.[19] More broadly, job differentiation lowers wages because it means that other jobs are too different from the current job and therefore not worth moving to. These differences could come from many factors, including relationships with managers. When a worker can afford not to work, their reservation wage also goes up: personal wealth and nonlabor income thus increase workers' wages.

There are similar factors that decrease firms' reservation profit and hence increase wages. Worker differentiation increases wages because it means there are few other workers that are good substitutes (and so the firm has lower reservation profits). Search costs on the firm side to advertise a vacancy, interview candidates, and so on, decrease the value of replacing the current worker. Worker-replacement costs, such as training costs, also make it less profitable for a firm to replace the current worker. In some cases, firms are cash-strapped and cannot afford these extra costs, so credit constraints can also lower reservation profits; however, this is not necessarily good for workers as credit constraints may prevent the growth of new firms and additional job creation. On balance, it is likely that relaxing credit constraints would help workers by promoting investment and job creation.[20]

Many policies affect workers' exit options. Unemployment insurance and income assistance such as food stamps theoretically increase workers' reservation wage because the value of being jobless increases. Minimum wages directly increase wages but also decrease reservation profits since the firm cannot make higher profits by replacing workers with others willing to work for less than the minimum wage. Similarly to minimum wages, regulations concerning working conditions put a floor on the total value of the job that goes to the worker. Macroeconomic policies that increase labor market tightness, such as monetary policy, can also increase wages. Antitrust laws that promote more competition among employers can decrease labor market concentration and limit restraints on worker mobility such as noncompete agreements. Less strict occupational licensing promotes worker

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[19] José Azar, Steven Berry & Ioana Marinescu, *Estimating Labor Market Power*, SSRN 19–21 (July 25, 2022), https://perma.cc/WSG6-UUL9.

[20] E. Mark Curtis, Daniel G. Garrett, Eric C. Ohrn, Kevin A. Roberts & Juan Carlos Suárez Serrato, *Capital Investment and Labor Demand* 9–10 (Nat'l Bureau of Econ. Rsch., Working Paper No. 29485, 2022).

mobility, increasing the value of outside options. Antidiscrimination law can in theory increase the wages of minorities that are discriminated against, both directly by increasing incumbent wages and indirectly by expanding the set of available jobs for people who are usually discriminated against. Workers can acquire more information when firms are required to post salary ranges, and they can use information more judiciously when firms are banned from asking a worker's wage history. Salary-history bans have been empirically shown to effectively increase the relative wages of women and minorities.[21] On the firm side, increasing the cost of replacing workers—through, for example, just cause provisions—can decrease firms' reservation profits and hence increase wages. While one may worry that just cause provisions decrease employment by increasing the cost of labor, the empirical literature shows limited employment effects.[22]

Strong empirical evidence documents certain of these policies' positive effects on worker power.[23] Specifically, strengthening labor antitrust enforcement by blocking anticompetitive mergers and limiting the use of noncompetes helps increase workers' wages.[24] Minimum wage laws help to increase wages, with typically small employment effects.[25] Unions can be helpful to combat the negative effects of concentration on wages.[26]

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Thus, adopting a search-theory approach to determining the relative power of employers and workers based on voice and exit provides a helpful framework for identifying and assessing policy levers that can increase worker power. And where one set of policies faces regulatory hurdles or is weakly enforced, stronger or

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[21] James Bessen, Erich Denk & Chen Meng, *Perpetuating Inequality: What Salary History Bans Reveal About Wages*, BOS. UNIV. SCH. OF L. 24–26 (June 2020), https://perma.cc/9CW8-6YJH.

[22] Adriana D. Kugler, *The Effects of Employment Protection in Europe and the USA*, ELS OPUSCLES DEL CREI 11–24 (Feb. 2007), https://perma.cc/QRG7-B8AM; Ioana Marinescu, *Job Security Legislation and Job Duration: Evidence from the United Kingdom*, 27 J. LAB. ECON. 465, 471–84 (2009).

[23] *See* Marinescu & Rosenfeld, *supra* note 6, at 12–24 (discussing empirical evidence at length).

[24] *See* Ioana Marinescu & Herbert J. Hovenkamp, *Anticompetitive Mergers in Labor Markets*, 94 IND. L.J. 1031, 1037–44 (2019).

[25] Marinescu & Rosenfeld, *supra* note 6, at 16–17.

[26] Efraim Benmelech, Nittai Bergman & Hyunseob Kim, *Strong Employers and Weak Employees: How Does Employer Concentration Affect Wages?* 15–17 (Nat'l Bureau of Econ. Rsch., Working Paper No. 24307, 2018); Prager & Schmitt, *supra* note 7, at 419–21.

more effective enforcement of others may help fill regulatory gaps to strengthen worker power. For this reason, successfully deploying policy levers that strengthen worker power depends considerably on the regulatory environment, institutional capacity, and coordination synergies between enforcement actors.

II. LABOR MARKET REGULATION AND WORKER POWER

Government institutions—and, most importantly for our purposes, regulatory agencies—shape market forces and implement public policies that determine workers' voice and exit options. This Part provides an overview of the agencies tasked with those determinations and the levers by which they exercise them. Cumulatively, these agencies are critical for reducing employer monopsony power and increasing worker power.

A. Regulation of Worker Voice

The primary regulatory mechanism impacting workers' relative bargaining power within the firm is the National Labor Relations Act[27] (NLRA), administered by the National Labor Relations Board (NLRB).[28] Workers' bargaining leverage is also indirectly regulated by the antitrust laws because certain forms of worker coordination—and, importantly, coordination among independent contractors—can be unlawful because, while the Clayton Act formally immunized "legitimate" labor organization activities, the scope of the labor exemption has been significantly narrowed by the courts and does not clearly apply to NLRA-exempted worker coordination.[29] Finally, while federal labor law substantially preempts state and local labor law regulation,[30] state law may enable worker voice through representation in tripartite commissions[31] or allowing shared governance or codeter-

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[27] National Labor Relations Act of 1935 (Wagner-Connery Labor Relations Act), 29 U.S.C. §§ 151–169.

[28] 29 U.S.C. § 153. For the NLRA's equal bargaining power purpose, see Hafiz, *Structural Labor Rights*, *supra* note 3, at 664–73.

[29] *See* 15 U.S.C. § 17; Hafiz, *Structural Labor Rights*, *supra* note 3, at 673–77; Sanjukta M. Paul, *The Enduring Ambiguities of Antitrust Liability for Worker Collective Action*, 47 LOY. U. CHI. L.J. 969, 1004–13 (2016).

[30] *See, e.g.*, Benjamin I. Sachs, *Despite Preemption: Making Labor Law in Cities and States*, 124 HARV. L. REV. 1153, 1164–69 (2011).

[31] *See* Kate Andrias, *Social Bargaining in States and Cities: Toward a More Egalitarian and Democratic Workplace Law*, 12 HARV. L. & POL'Y REV. ONLINE 1, 6–12 (2017).

mination through employee representation and cumulative voting on corporate boards.[32] Table 1 illustrates the policies and institutions that impact workers' say in the terms and conditions of their work.

TABLE 1: REGULATION OF WORKER VOICE

Factors	**Policies and Institutions Impacting Worker Voice**	**Agencies**
Workers' Bargaining Power to Increase Share of Surplus	Unions	NLRB DOJ, FTC, State Attorneys General (labor exemption)
	Multiemployer, Pattern, and Sectoral Bargaining	NLRB State and Local Commissions
	Codetermination, Employee/Retiree Influence Over Corporate Decision-making	SEC (disclosure rules and minimum voting standards) [Accountable Capitalism Act, S. 3348, 115th Cong. (2018) – Office of US Corporations]
Workers' Voice and Control (incomplete contracts)	Labor Regulation (restraining employers' unilateral control over working conditions inside the firm)	NLRB DOL, DOL subagencies (WHD, OSHA), and state/local equivalents EEOC and state/local equivalents

[32] *See* Jens Dammann & Horst Eidenmüller, *Codetermination: A Poor Fit for U.S. Corporations*, 3 COLUM. BUS. L. REV. 870, 901–03 (2020); Lenore Palladino, *Economic Democracy at Work: Why (and How) Workers Should Be Represented on US Corporate Boards*, 1 J. L. & POL. ECON. 373, 382–89 (2021).

	Antidiscrimination Policies	EEOC and state/local equivalents
	Unions	NLRB DOJ, FTC, State Attorneys General (labor exemption)
	Codetermination, Employee/Retiree Influence Over Corporate Decision-Making	SEC (disclosure rules and minimum voting standards) [Accountable Capitalism Act, S. 3348, 115th Cong. (2018) – Office of US Corporations]

1. National Labor Relations Board.

The NLRB is the sole regulatory agency responsible for ensuring "equal[ ] . . . bargaining power between employers and employees."[33] The Board is tasked with guaranteeing workers' substantive rights under § 7 of the NLRA—the rights to organize, collectively bargain, and engage in concerted activity—and enforcing rules against unfair labor practices, including employers' intimidation or discrimination against workers for organizing, refusal to collectively bargain in good faith, or interference with striking employees.[34] The Board also makes jurisdictional determinations about which workers and employers are protected and have duties and obligations under the Act, including by deciding whether workers are "employees" (protected) or "independent contractor[s]" (unprotected), and whether firms that contract for labor through franchising, outsourcing, or subcontracting are "joint employers" required to collectively bargain with workers.[35] The Board's interventions, and failures to intervene, in workers'

[33] 29 U.S.C. § 151.
[34] 29 U.S.C. §§ 157–158(a).
[35] 29 U.S.C. § 152(2)–152(3).

organizing efforts and collective bargaining impact workers' bargaining power relative to employers.[36]

The Board collects significant data and makes factual findings in its enforcement that are directly relevant for ascertaining worker power. First, the Board has a record of employers' noncompliance with the NLRA, including instances where employers committed unfair labor practices by violating workers' right to organize, collectively bargain, or strike. Employer noncompliance can be evidence of monopsony power, or an employer's ability to profitably and unilaterally lower wages and worsen working conditions without workers quitting.[37] But noncompliance can also be evidence of anticompetitive conduct because it can reduce worker welfare and aid in maintaining or enhancing employer monopsony.[38] Existing legal protections establish a baseline against which workers bargain, and noncompliance with those protections by committing unfair labor practices like refusing to bargain in good faith, terminating workers for organizing activity, or misclassifying workers as independent contractors pushes workers below that baseline, reducing their bargaining leverage and ability to counter an employer's monopsony power.[39] It can also harm an employer's rivals by reducing an employer's labor costs, giving that employer a wedge against law-abiding competitors: compliance is costlier than noncompliance,[40] and unionized workers generally receive a wage premium relative to nonunionized workers, as do employees relative to misclassified independent contractors.[41] Thus, noncompliance may be understood as a

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[36] *See* Hafiz, *Structural Labor Rights*, *supra* note 3, at 673–87 (arguing that NLRA enforcement contributed to employers' stronger bargaining power over workers and advocating for "structural" approach to correct imbalance); *see also* Hiba Hafiz, *Economic Analysis of Labor Regulation*, 2017 WIS. L. REV. 1115, 1134–38 (2017) [hereinafter Hafiz, *Economic Analysis*].

[37] Ioana Marinescu & Eric A. Posner, A Proposal to Enhance Antitrust Protection Against Labor Market Monopsony 16 (Roosevelt Inst., Working Paper, 2018).

[38] *Id.* at 14–17.

[39] *See generally* Benmelech, Bergman & Kim, *supra* note 26.

[40] *See, e.g.*, Cynthia Estlund, *What Should We Do After Work? Automation and Employment Law*, 128 YALE L.J. 254, 287–91 (2018).

[41] For union wage premium, see, for example, David Card, *The Effect of Unions on the Structure of Wages: A Longitudinal Analysis*, 64 ECONOMETRICA 957, 976–78 (1996), Henry Farber, Daniel Herbst, Ilyana Kuziemko & Suresh Naidu, *Unions and Inequality over the Twentieth Century: New Evidence from Survey Data*, 136 Q.J. ECON. 1325, 1344–55 (2021), and Barry T. Hirsch & Edward J. Schumacher, *Unions, Wages, and Skills*, 33 J. HUM. RES. 201, 209–13 (1998). *But see* Brigham R. Frandsen, *The Surprising Impacts of Unionization: Evidence from Matched Employer-Employee Data*, 39 J. LAB. ECON. 861, 879–81 (2021). For independent contractor wage penalties, see, for example, Arindrajit

mechanism for increasing employer monopsony by raising rivals' relative costs.[42]

In addition to records of employer noncompliance, the NLRB collects data and makes factual findings critical for worker power assessments within the administrative state more broadly. Its jurisdictional findings regarding worker and employer exemptions from the NLRA can identify which labor service providers lack organizing protections and may even be subject to antitrust liability for coordinating against employers.[43] Such workers may lack voice as a source of worker power. The Board also receives data about collective bargaining agreement terms, the size of union bargaining units relative to an employer's broader workforce, the history of organizing and strike activity, evidence of employer control of workers' wages and working conditions (including of purported joint employers), and evidence of unions' successor status following mergers and acquisitions. While the NLRB is prohibited from hiring economists to compile and analyze this data,[44] its collection and use of data in investigations and enforcement actions is invaluable for gauging worker power for broader labor market regulatory efforts.

2. Antitrust agencies.

The antitrust agencies impact worker voice when they target worker coordination as cartel activity unprotected by the labor

Dube & Ethan Kaplan, *Does Outsourcing Reduce Wages in the Low-Wage Service Occupations? Evidence from Janitors and Guards*, 63 INDUS. & LABOR RELS. REV. 287, 291–93 (2010), David Weil, *Lots of Employees Get Misclassified as Contractors. Here's Why It Matters*, HARV. BUS. REV. (July 5, 2017), https://perma.cc/8LXZ-3PJC, Lawrence Mishel & Josh Bivens, *Identifying the Policy Levers Generating Wage Suppression and Wage Inequality*, ECON. POL'Y INST. 39–42 (May 13, 2021), https://perma.cc/YS2E-VSUY, and Maarten Goos, Alan Manning, Anna Salomons, Bas Scheer & Wiljan van den Berge, *Alternative Work Arrangements and Worker Outcomes: Evidence from Payrolling*, CPB 14–16 (Mar. 2022), https://perma.cc/ZAS2-ZLU7.

[42] For raising rivals' costs, see, for example, Einer Elhauge, *Defining Better Monopolization Standards*, 56 STAN. L. REV. 253, 320–24 (2003), Thomas G. Krattenmaker & Steven C. Salop, *Anticompetitive Exclusion: Raising Rivals' Costs to Achieve Power over Price*, 96 YALE L.J. 209, 230–41 (1986), and Steven C. Salop & David T. Scheffman, *Raising Rivals' Costs*, 73 AM. ECON. REV. 267, 268–70 (1983).

[43] *See* 29 U.S.C. § 152(3). For antitrust law and the labor exemption, see, for example, Sanjukta Paul, *Fissuring and the Firm Exemption*, 82 L. & CONTEMP. PROBS. 65, 67–78 (2019), and Marina Lao, *Workers in the "Gig" Economy: The Case for Extending the Antitrust Labor Exemption*, 51 UNIV. CAL. DAVIS L. REV. 1543, 1559–65 (2018).

[44] 29 U.S.C. § 154(a); Hafiz, *Economic Analysis*, *supra* note 36, at 1119–29.

exemption to the antitrust laws.[45] To the extent the agencies (and reviewing courts) subject worker coordination to criminal sanctions, injunctions, or treble damages liability, they can reduce worker voice and chill worker organizing due to litigation risk.[46]

Antitrust agencies have charged independent contractors with unlawful collusion, and courts have generally held their coordination ineligible for the labor exemption.[47] But while the agencies have expressed interest in expanding the exemption,[48] they have yet to establish a policy on enforcement in misclassification cases. Agency and court analyses of the labor exemption's scope lack clear metrics for determining when independent contractors may coordinate or withhold services free of liability, reinforcing the uncertainty of the exemption's application.

The data and analyses collected in antitrust agency investigations and enforcement are useful for assessing worker voice. They reveal what, if any, agreements—e.g., noncompetition agreements and vertical restraints—that labor providers are subject to strengthen or weaken their bargaining leverage relative to trading partners, including evidence of trading partners' countervailing control over wages and terms and conditions of service.

3. State and local regulation.

State and local governments can regulate worker voice under two legal exemptions: exceptions to NLRA preemption and to antitrust law liability under *Parker* immunity, developed in the case

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[45] *See, e.g.*, FTC v. Super. Ct. Trial Laws. Ass'n, 493 U.S. 411 (1990) (holding that a boycott of providing court-appointed defense to indigent clients by members of an association of independently employed trial lawyers in an effort to secure higher rates was an unlawful conspiracy to fix prices regardless of "social justifications"); L.A. Meat & Provision Drivers Union, Loc. 626 v. United States, 371 U.S. 94 (1962) (holding that a labor union and a subgroup of its members violated antitrust laws by enforcing and agreeing to fixed purchase and sale prices).

[46] *See, e.g.*, Brief of the U.S. Department of Justice. as Amicus Curiae in Support of Neither Party, The Atlanta Opera, Inc. and Make-Up Artists and Hair Stylists Union, Loc. 798, IATSE, 10-RC-276292, at *5 (NLRB Feb. 10, 2022).

[47] *See Sup. Ct. Trial Laws. Ass'n*, 493 U.S. 411; *L.A. Meat*, 371 U.S. 94; Columbia River Packers Ass'n v. Hinton, 315 U.S. 143 (1942) (holding that independent fishermen's sales to a fish processor had no bearing on an employer-employee relationship). *But see* Confederación Hípica de Puerto Rico, Inc. v. Confederación de Jinetes Puertorriqueños, Inc., 30 F.4th 306 (1st Cir. 2022) (holding that jockeys' alleged independent-contractor status does not categorically make them ineligible for the labor exemption).

[48] *See, e.g.*, Siri Bulusu, *FTC's Khan Urges Antitrust Legislation to Protect Gig Workers*, BLOOMBERG L. (Sept. 28, 2021), https://perma.cc/95YK-LWE7.

Parker v. Brown.[49] First, state and local governments can regulate organizing and bargaining by workers exempted from the NLRA or can avoid NLRA preemption when they act as "market participant[s]" intervening to shape labor-management relations through "tripartite lawmaking."[50] Examples of tripartism include conditioning permits and zoning decisions or infrastructure policy on employer recognition of organizing rules and collective bargaining obligations.[51] Second, *Parker* immunity protects exempted NLRA worker coordination if done under a state's active supervision.[52] Consistent with these exemptions, state and local governments can strengthen worker voice by creating tripartite commissions with employer and employee representation empowered to decide wages or other standards.[53]

B. Regulation of Workers' Exit Options

Worker power is also determined by workers' exit options and the employers' outside options to a specific employment relationship: more good jobs, and easier movement between jobs, increases workers' reservation wage; fewer other suitable workers, and more costs in replacing them, decreases hiring firms' reservation profit.[54] Government regulation of the relative reservation wages and profits of workers and firms is administered through a wide range of policies by a network of labor and nonlabor agencies. Table 2 illustrates the market forces, policies, and government institutions that impact workers' and firms' exit options.

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[49] 317 U.S. 341 (1943).

[50] *See* Sachs, *supra* note 30, at 1168–90, 1199–1200.

[51] *Id.* at 1174–90.

[52] *See* N.C. State Bd. of Dental Exam'rs v. FTC, 574 U.S. 494, 511 (2015).

[53] For tripartite wage boards, see Andrias, *supra* note 31, at 10–12. For state corporate law and worker representation, see Palladino, *supra* note 32, at 382–89. State corporate law reforms allowing worker representation on boards may be subject to challenges on preemption and "company union" grounds. 29 U.S.C. § 158(a)(2).

[54] *See* Marinescu & Rosenfeld, *supra* note 6, at 6–12.

TABLE 2: REGULATION OF WORKERS' EXIT OPTIONS

Factors	**Market Forces Impacting Exit**	**Policies and Institutions Impacting Exit**	**Agencies**
Workers' Reservation Wage	Labor Market Tightness	Macroeconomic Policies to Increase Tightness	Federal Reserve, U.S. Treasury
	Labor Market Concentration	Merger Policy; Antimonopsony Law	DOJ, FTC, State Attorneys General
	Search Costs and Imperfect Information	Unemployment Insurance	DOJ, FTC, State Attorneys General NLRB DOL and State-Level Agencies DOL-OFCCP EEOC and state/local equivalents
	Moving Costs	Mobility Restrictions	DOJ, FTC, State Attorneys General
	Job Differentiation	Occupational Licensing	DOJ, FTC, State Attorneys General State-Level Licensing Boards
	Personal Wealth and Nonlabor Income	Income Assistance	Treasury-IRS (EITC, etc.); USDA (food stamps); HUD (housing); DHHS-OFA (TANF, etc.); SSA (social se-

			curity benefits); VA (veterans' benefits); Department of Education (Pell Grants, student debt); DOL-ETA (training) State Human/Social Service Agencies
	Discrimination	Antidiscrimination Law	EEOC and state/local equivalents
Firm's Reservation Profit	Turnover costs	Job Protections / Firing Costs	Federal Reserve, US Treasury NLRB; EEOC and state equivalents State Law/Courts (just cause)
	Worker differentiation	Minimum Wage/ Maximum Hour Law Education	DOL, Subagencies (WHD), Office of Federal Contract Compliance Programs (OFCCP), ETA and state equivalents; DOJ/FTC/State Attorneys General (wage discrimination); NLRB; EEOC and

			state/local equivalents; Immigration Agencies (DHS, ICE, DOL) DOL-ETA, Department of Education
	Training Costs	Training/Apprenticeship Programs	DOL-ETA State Human/Social Service Agencies
	Discrimination	Antidiscrimination Law	DOL EEOC and state/local equivalents
	Credit Constraints	Small business loans, etc.	Federal Reserve, FDIC, NCUA, OCC, CFPB, SBA

1. Federal labor agencies.

Regulation by three core labor agencies impacts workers' and employers' exit options: the Department of Labor (DOL) and its subagencies, the Equal Employment Opportunity Commission (EEOC), and the NLRB.

First, labor agencies can impact firms' reservation profit by regulating firms' access to outside options in the form of cheaper labor inputs. Most importantly, the DOL's Wage and Hour Division (WHD) imposes a wage floor by establishing minimum wages, maximum hours, and overtime regulation, and clarifies thresholds of employee eligibility, employer status, and exemptions from liability.[55] The DOL's Occupational Safety and Health Administration (OSHA) imposes minimum safety and health standards that set a floor for risk-adjusted wages: employers cannot reduce the quality of employment in their workplaces below a

[55] *See* Fair Labor Standards Act, 29 U.S.C. §§ 201–219.

regulated level of risk exposure.[56] Minimum wage and workplace safety and health laws also prevent firms from taking advantage of worker differentiation to the extent that some workers are willing to work for lower wages or under worse working conditions. The EEOC administers Title VII, which prohibits employers from hiring, firing, or differentiating between workers on a discriminatory basis based on protected classifications (race, color, religion, sex, and national origin).[57] By establishing higher minimum wages and labor standards in project labor agreements with federal contractors, the DOL can lift those floors even higher.[58] And the DOL's Employment and Training Administration (ETA) can fund and administer specialized skills trainings that make workers harder to replace.[59] Finally, the NLRB can support collectively bargained-for job protections (increasing firms' firing costs) and closed shop agreements (limiting employer hiring to union-only workers or union hiring halls).

Second, labor agencies can increase worker power by easing workers' access to outside options, thus increasing their reservation wage. While states fund unemployment insurance as a backstop allowing workers to survive without a job, the DOL's Education and Training Administration (ETA) administers job-training and worker-dislocation programs to train or retrain workers, especially those dislocated by layoffs, downsizing, and corporate restructuring. Along with the DOL's Office of Unemployment Insurance Modernization, it administers and provides oversight to federal grants to state and local workforce-development agencies. Additionally, the labor agencies can decrease workers' search costs and remedy imperfect information in labor markets by requiring employer notice of workers' labor and employment rights as well as of employers' noncompliance. The EEOC, NLRB, and the DOL's Office of Federal Contract Compliance (OFCCP) can increase wage transparency and even impose salary-history bans to enable workers to strike better deals.[60] And

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[56] Occupational Safety and Health Act, 29 U.S.C. §§ 651–678.

[57] Civil Rights Act of 1964 § 7, 42 U.S.C. §§ 2000e–2000-17.

[58] *See* Exec. Order No. 14,063, 87 Fed. Reg. 7,363 (Feb. 4, 2022); 20 C.F.R. § 10; 23 C.F.R. § 230.

[59] *About Us*, U.S. DEP'T OF LABOR EMP. & TRAINING ADMIN, https://perma.cc/TKY9-6MFM.

[60] The EEOC collects pay-related questions under the EEO-1 Component 2 diversity survey. *See, e.g.*, Anne Cullen, *EEOC Leader Says Wage Data Crucial to Pay Equity*, LAW360 (Mar. 24, 2022), https://perma.cc/NL5Q-FZXZ. The NLRB protects collective bargaining overcompensation scales ratified in collective bargaining agreements accessible to

the DOL's Employee Benefits Security Administration can reduce workers' moving costs through easing the portability of and reducing the leakage from workers' retirement savings when they change jobs.

In all, the labor agencies collect and analyze data and have employer compliance records that offer a much clearer picture of workers' outside options relative to looking merely at the number and size of competitor employers alone. Specifically, they reveal, at a much more granular level, the extent to which workers have and can exercise quit threats for more bargaining leverage to improve their compensation.

2. Federal antitrust agencies.

Federal antitrust enforcement by the Department of Justice (DOJ)'s Antitrust Division and Federal Trade Commission (FTC) also impacts firms' reservation profit and workers' reservation wage and can reduce employer monopsony power and increase worker power.

While most regulation of firms' outside options is governed by labor law, the antitrust agencies can reduce *employers'* outside options through a number of levers. First, as discussed, expansive interpretation of the labor exemption would lower firms' outside options by allowing workers to collectively refuse to deal with firms that do not meet their compensation standards. Second, by limiting wage discrimination against independent contractors as an unlawful exercise of firm monopsony, agencies could limit dominant firms' outside hiring options in the labor market.[61] And third, by prohibiting employers' use of anticompetitive vertical restraints in labor and product markets, agencies can reduce firms' outside options. For example, Uber's combined use of vertical price and nonprice restraints (like nonlinear pay and minimum

employees and voluntarily disclosed to the DOL's Office of Labor-Management Standards. The Biden Administration has encouraged the DOL to issue rules enhancing pay equity and transparency for job applicants, including through salary-history bans in federal contracting. *See* Exec. Order No. 14,069, 87 Fed. Reg. 15,315 (Mar. 15, 2022); *Directive 2022-01*, U.S. DEP'T OF LABOR OFF. OF FED. CONT. COMPLIANCE PROGRAMS (Mar. 15, 2022), https://perma.cc/PY49-RR2L.

[61] *See* Sherman Antitrust Act, 15 U.S.C. § 2. Hiring independent contractors instead of employees can allow employers to wage discriminate by paying internal labor market wages to employees and lower market wages to contracted workers. *See, e.g.*, Weil, *supra* note 3, at 76–91. Agencies' narrow interpretation of the labor exemption as inapplicable to independent contractor coordination and refusals to deal may enable firms' wage discrimination between employees and independent contractors.

acceptance rates) can reduce steering, increase drivers' switching costs, and reduce drivers' take-home pay.[62] Prohibiting firms from using certain vertical restraints can reduce firms' contracting options for labor inputs and, thus, their reservation profit. Restraints of concern include price and nonprice restraints in product markets, such as input purchase requirements, that reduce labor demand as a complementary input.[63]

But the agencies have more policy levers to increase *workers'* outside options through enforcement, effectively lifting workers' reservation wage. First, the agencies' enforcement of the antitrust laws' prohibition of unlawful monopsony and anticompetitive employer agreements can increase workers' bargaining power and reduce workers' search and moving costs between employers. For example, enforcement against exclusionary agreements tying workers to firms for lengthy contract periods or against mobility restraints on workers' ability to switch employers or start their own firms—like noncompete, no-poach, training-repayment, nondisclosure, and other provisions—increases workers' outside options.[64] Enforcing against horizontal agreements between employers that restrain compensation or hiring is particularly critical because workers often lack knowledge of them. Workers are not parties to agreements between employers, and employers are incentivized to keep such agreements secret because they can violate the antitrust laws.[65] Pervasive use of noncompete agreements can suppress employment opportunities and increase search costs for both employers and workers market-wide.[66] Further, antitrust agencies' merger enforcement reduces labor market concentration, which can increase labor market competition

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[62] *See, e.g.*, Marshall Steinbaum, *The Antitrust Case Against Gig Economy Labor Platforms*, LPE BLOG (Apr. 7, 2022), https://perma.cc/R67W-RHBL.

[63] *See generally* Hafiz, *Brand Defense*, *supra* note 3, at 33–35.

[64] Other agencies can facilitate worker mobility to increase workers' outside options, including by subsidizing housing under the Fair Housing Act (administered by the U.S. Department of Housing and Urban Development) and by regulating mortgage lending (administered by the CFPB).

[65] *See, e.g.*, Hafiz, *Structural Labor Rights*, *supra* note 3, at 658.

[66] *See* Eric A. Posner, *The Antitrust Challenge to Covenants Not to Compete in Employment Contracts*, 83 ANTITRUST L.J. 165, 190–91 (2020).

and limit firms' ability to unilaterally set or coordinate compensation.[67] Finally, enforcement against occupational licensing restrictions can increase workers' ability to switch jobs and move across jurisdictions, increasing their outside options.[68]

Through their enforcement, antitrust agencies collect a significant amount of data and produce analyses of that data. First, through merger enforcement, the agencies collect labor market–power evidence, including wage and other data regarding employee compensation and employment contract provisions such as noncompetes. Additionally, the agencies conduct market-definition and market-power analyses, economic analyses of wage transactions, analyses of collusion and the impacts of employers' horizontal and vertical agreements, and analyses of the unilateral and coordinated labor market effects of mergers and acquisitions.

3. Other federal and state agencies.

Finally, other federal and state agencies impact workers' and firms' exit options through policies that increase labor market tightness, workers' personal wealth and nonlabor income, firm credit, worker differentiation, or decrease job differentiation.

First, federal agencies setting macroeconomic policy can increase worker power by lowering investment costs and increasing job availability.[69] The Federal Reserve is tasked with setting monetary policy and interest rates that can stimulate investment and raise employment.[70] The federal government also utilizes policy levers impacting workers' personal wealth, which can increase their reservation wage and ability to hold out for better employment bargains. The U.S. Treasury Department and Internal Revenue Service enforce the tax code, including the Earned Income Tax Credit (EITC) and Child Tax Credit (CDC) that put more cash in workers' and working families' pockets but, because

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[67] 15 U.S.C. § 18; *Horizontal Merger Guidelines*, U.S. DEP'T OF JUST. 2 (Aug. 19, 2010), https://perma.cc/GJM6-2CDB; *see* Marinescu & Rosenfeld, *supra* note 6, at 4.

[68] *See* Marinescu & Rosenfeld, *supra* note 6, at 13–14.

[69] *Id.* at 13.

[70] *Id.* at 16. The U.S. Treasury Department also impacts investment and employment by managing federal spending and implementing monetary policy. Immigration agencies regulate migration that can not only impact labor market tightness but also chill undocumented worker complaints for employer noncompliance. *See, e.g.*, Amanda M. Grittner & Matthew S. Johnson, *When Labor Enforcement and Immigration Enforcement Collide: Deterring Worker Complaints Worsens Workplace Safety* 14 (Upjohn Inst., Working Paper No. 21-353, 2021).

they are conditional on work, can decrease labor market tightness and, thus, workers' take-home wage.[71] Cash and in-kind assistance programs can also increase workers' reservation wage due to their income effects.[72] Other federal agencies—the Treasury Department (and its subagencies), Consumer Financial Protection Bureau (CFPB), Federal Deposit Insurance Corporation (FDIC), the National Credit Union Administration (NCUA), and the Small Business Administration (SBA)—impact commercial and retail lending, or firms' access to credit, as well as individuals' credit access as a source of personal wealth or as a means of establishing new firms to compete with employers. And federal student loan and job-training programs—administered by the U.S. Department of Education and the DOL's ETA—can decrease mobility-limiting job differentiation by expanding the jobs workers are eligible for through providing higher or more general skills training. Those loans and training programs can also increase worker differentiation by allowing higher worker specialization that makes workers more difficult to replace. Both can thus increase workers' reservation wage.

State and local governments can increase workers' reservation wage by allocating and administering unemployment insurance benefits as well as human or social service programs for low-income workers and families. State-level agencies primarily administer unemployment insurance, sometimes with federal supplements, and data pertaining to administration of those programs is collected by the ETA's Unemployment Insurance Data program.[73] Some state and local governments have created and

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[71] Marinescu & Rosenfeld, *supra* note 6, at 20–21.

[72] In-kind benefits include but are not limited to: Fair Housing Act benefits, 42 U.S.C. §§ 3601–3631 (administered by the Department of Housing and Urban Development); Affordable Care Act health care benefits, 124 Stat. 119, 119–130 (administered by the Department of Human Health and Services and Centers for Medicare & Medicaid Services, among others); Social Security Act benefits, 42 U.S.C. §§ 1301–1305 (administered by the Social Security Administration); Temporary Assistance for Needy Families Program benefits, 42 U.S.C. §§ 601–619; 42 U.S.C. § 1308 (administered by Office of Family Assistance); veterans' benefits (administered by the Veterans Benefits Administration and DOL's Veterans' Employment and Training Service); Lifeline Program benefits from the Universal Service Fund (administered by the Federal Communication Commission's Universal Service Administrative Company); and food stamps, 7 U.S.C. §§ 2011-2036d (administered by the Department of Agriculture).

[73] *See Unemployment Insurance Data*, U.S. DEP'T OF LAB. EMP. & TRAINING ADMIN., https://perma.cc/6SV9-SK3A (last updated July 7, 2022). Data on unemployment is collected by the BLS's Local Area Unemployment Statistics program. *Local Area Unemployment Statistics*, U.S. BUREAU OF LAB. STAT., https://perma.cc/MQ3W-Z577 (last modified Mar. 20, 2020).

administer unconditional cash programs, but while such transfers increase consumer spending, which can tighten labor markets by increasing employment and, thus, worker power, there is still no direct evidence of reservation-wage effects.[74] Finally, state and local government agencies administer broader social insurance programs for income supports, workforce development, education programs, health and nutrition benefits, and housing.[75] Many of these programs have work requirements, which can blunt their ability to generate worker power by increasing labor supply, decreasing labor market tightness and, therefore, wages.[76]

C. Regulatory Slack and Worker Power

While government agencies use policy levers and gather data relevant for assessing employer and worker power, regulatory slack can weaken their impact due to resource constraints and jurisdictional limitations.

First, the labor agencies face significant budgetary and staffing constraints that limit their enforcement against employer labor and employment law violations, including wage theft, worker misclassification, workplace safety and health violations, and unlawful union busting.[77] As their budgets have stagnated or been cut over the last decades, the number of workers and workplaces that they are responsible for has only increased.[78] The antitrust

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[74] Marinescu & Rosenfeld, *supra* note 6, at 19. For an overview of UBI research, see *Visualizing UBI Research*, STANFORD BASIC INCOME LAB, https://basicincome.stanford.edu/research/ubi-visualization/.

[75] For an overview, see, for example, Mitchell Barnes, Lauren Bauer, Wendy Edelberg, Sara Estep, Robert Greenstein & Moriah Macklin, *The Social Insurance System in the U.S.: Policies to Protect Workers and Families*, BROOKINGS INST. (June 2021), https://perma.cc/E2G5-NJY8.

[76] Marinescu & Rosenfeld, *supra* note 6, at 19–21.

[77] *See, e.g.*, David Weil, *Improving Workplace Conditions Through Strategic Enforcement*, U.S. DEP'T OF LABOR 5–8 (May 2010), https://perma.cc/Z38B-NBLB; Ihna Mangundayao, Celine McNicholas, Margaret Poydock & Ali Sait, *More Than $3 Billion in Stolen Wages Recovered for Workers Between 2017 and 2020*, ECON. POL'Y INST. 4 (Dec. 22, 2021), https://perma.cc/7XGN-5KFG; Ann Rosenthal, *Death by Inequality: How Workers' Lack of Power Harms Their Health and Safety*, ECON. POL'Y INST. 17–21 (Apr. 19, 2021), https://perma.cc/7WYR-V24E; *National Labor Relations Board: Meaningful Performance Measures Could Help Improve Case Quality, Organizational Excellence, and Resource Management*, GAO 13–18 (Mar. 2021), https://perma.cc/NSR7-LXDG.

[78] *See* Weil, *supra* note 77, at 5–15; Ihna Mangundayao & Celine McNicholas, *Congress Should Boost NLRB Funding to Protect Workers' Wellbeing*, ECON. POL'Y INST. WORKING ECON. BLOG (Feb. 28, 2022), https://perma.cc/V9AB-LGZ3.

agencies similarly face financial resource and manpower constraints to challenging anticompetitive conduct in labor markets.[79] Agencies administering social insurance and social safety net programs face similar challenges.[80]

Theoretically, private rights of action enabling civil enforcement could make up for agencies' regulatory slack. But some statutes—like the NLRA, Occupational Safety and Health Act (OSH Act), and the Federal Trade Commission Act (FTC Act)—do not grant private rights of action.[81] And private enforcement faces significant obstacles, including information barriers regarding employer collusion, procedural obstacles to certifying class actions, mandatory arbitration provisions and class action waivers in employment and other contracts, the lack of natural corporate plaintiffs, and the risk and expense of bringing suits.[82]

Second, legislative carve-outs and narrow judicial interpretations of agencies' jurisdiction and authority have limited agencies' ability to reduce employer power and increase worker power. Federal labor and employment statutes exempt a number of workers from their protections, including independent contractors, supervisory and managerial workers, farmworkers, domestic and home care workers, and state and local employees.[83] Courts have interpreted these exemptions broadly.[84] Federal law also limits the types of employers accorded duties and obligations to workers, and there is significant legal uncertainty as to whether firms that fissure, outsource, or subcontract for labor inputs are subject to

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[79] *See, e.g.*, Bryan Koenig, *Limited Resources Will Test DOJ Preference for Merger Suits*, LAW360 (Jan. 26, 2022), https://perma.cc/7WTS-DFCT; Christine S. Wilson, *Governing is Hard: Antitrust Enforcement in the First Year of the Biden Administration*, U.S. FED. TRADE COMM'N 5–6 (Jan. 26, 2022), https://perma.cc/8DB5-5L8S; Bill Baer, Jonathan B. Baker, Michael Kades, Fiona Scott Morton, Nancy L. Rose, Carl Shapiro & Tim Wu, *Restoring Competition in the United States: A Vision for Antitrust Enforcement for the Next Administration and Congress*, WASH. CTR. FOR EQUITABLE GROWTH 14–15 (Nov. 2020), https://perma.cc/YUX7-5KC3.

[80] *See, e.g.*, THEODORE R. MARMOR, JERRY L. MASHAW & JOHN PAKUTKA, SOCIAL INSURANCE: AMERICA'S NEGLECTED HERITAGE AND CONTESTED FUTURE 40–46 (2014).

[81] *But see* 29 U.S.C. § 185(a); Boys Mkts., Inc. v. Retail Clerks Union, Loc. 770, 398 U.S. 235 (1970) (finding that the Norris-LaGuardia Act did not prohibit granting injunction under narrow circumstances).

[82] Ioana Marinescu & Eric A. Posner, *Why Has Antitrust Law Failed Workers?*, 105 CORNELL L. REV. 1343, 1362–82 (2020).

[83] *See* 29 U.S.C. § 152(3); 29 U.S.C. § 213; 42 U.S.C. § 2000e(f); 29 U.S.C. § 1002(6).

[84] *See* Hafiz, *Structural Labor Rights*, *supra* note 3, at 677–79 (collecting cases).

compliance requirements under law as "joint employers."[85] Further, antitrust courts have issued inconsistent decisions in labor antitrust cases, establishing limited precedent.[86]

III. STRENGTHENING WORKER POWER THROUGH REGULATION

While agencies administer a number of policies impacting the relative power of employers and workers, they lack uniform metrics for assessing that power when administering their regulatory mandates, whether in the investigation, enforcement, remedial, or postremedial stages. Further, agencies lack robust institutional relationships for sharing data and analyses relevant for assessing employer or worker power. Such sharing is necessary to avoid regulatory arbitrage and ensure a coherent, whole-of-government approach to effectively increasing worker power. An interagency approach is also critical for setting and achieving enforcement priorities where workers may need it most. This Part outlines a regulatory checklist of bargaining power indicators, identifying a uniform set of metrics and relevant data that agencies could use to assess employer and worker power. It then draws from the empirical literature to propose policy priorities for interagency enforcement based on their demonstrated ability to increase worker power.

A. Regulatory Checklist of Bargaining Power Indicators

Agencies can use many measures to gauge worker power through the exit or voice dimensions. Data sharing across agencies would improve those measures, making enforcement more effective. And once data have been pulled out, documented, and shared, it is easier to reshare them.[87]

The following Table lists indicators of worker and employer power based on exit and voice, identifying public and private data sources that report them:

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[85] Weil, *supra* note 3, at 183–213; *see also* Hafiz, *Structural Labor Rights*, *supra* note 3, at 656–58.

[86] *See* Marinescu & Posner, *supra* note 82, at 1362–82; Hiba Hafiz, *Labor Antitrust's Paradox*, 86 U. CHI. L. REV. 381, 392–99 (2020).

[87] Agencies need memoranda of understanding (MOUs) to facilitate data sharing, and such MOUs have already been signed between the antitrust and labor agencies.

TABLE 3: BARGAINING POWER INDICATORS BASED ON EXIT AND VOICE

Factors	**Indicators of Worker/Employer Power**	**Public and Private Data Sources**
Workers' Exit Options	Labor market tightness (number of job vacancies / number of unemployed) Labor market concentration Labor share Minimum wage Employer violations of workers' rights (working conditions, hiring and firing) Employer antitrust law violations (unlawful monopsony, wage fixing, mobility restraints, market allocation agreements, other vertical restraints)	Number of job vacancies: BLS JOLTS, Burning Glass Technologies Number of unemployed: BLS Current Population Survey & LAUS Burning Glass Technologies BLS Office of Productivity and Technology DOL Minimum Wage Rate by State NLRB, OSHA, EEOC, Good Jobs First Violation Tracker DOJ/FTC Case Files
Workers' Voice and Control (incomplete contracts)	Union membership Strike activity Organizing drives Employer NLRA violations	BLS Current Population Survey BLS Work Stoppages Program, NLRB Case Files/Activity Reports, DOJ/FTC Case Files ("independent contractors") NLRB Case Files/Activity Reports NLRB Case Files/Activity Reports, Good Jobs First Violation Tracker

These worker power indicators can help gauge how much power workers have in specific geographic locations, occupations, or industries. We already discussed most indicators and related concepts above, except for the labor share.[88] The labor share is the fraction of output that goes to workers in the form of labor compensation. When the labor share decreases, it suggests that workers have lower power.[89]

B. A Whole-of-Government Agenda for Worker Power

While worker power indicators can aid agencies in determining which labor markets they should target for enforcement, an evidence-based approach may also be used to rank policy priorities based on their demonstrated ability to increase worker power. This Section draws from current empirical knowledge in the worker power literature to identify those priorities. It also maps out mechanisms by which interagency coordination could aid in effectuating them.

1. Policy priorities to enhance worker voice.

Building labor market institutions, such as labor unions, that give workers voice is a promising means of increasing workers' bargaining power to increase wages and improve working conditions. Unionized workers receive a "union wage premium" of between 15–25% and more generous benefits relative to similarly situated nonunion workers.[90] But unions can also lift wages and working conditions offered by nonunion employers competing

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[88] Michael D. Giandrea & Shawn Sprague, *Estimating the U.S. Labor Share*, U.S. BUREAU OF LAB. STAT. (Feb. 2017), https://perma.cc/6VHP-LZJW.

[89] When the labor share decreases, it could indicate an increase in capital investment: if there is more capital relative to labor in production, then the labor share is smaller, as capital is compensated for its contribution to production. When firms invest in capital, it does not necessarily lower the labor share if firms also use more labor to go with that additional capital. The labor share decreases only when labor is substituted with capital. Firms substituting capital for labor can be an indication of a decline in worker power. *See, e.g.*, JAN EECKHOUT, THE PROFIT PARADOX 71–94 (Joe Jackson & Josh Drake eds., 2021).

[90] JAKE ROSENFELD, WHAT UNIONS NO LONGER DO 45–51 (2014); *see also, e.g.*, Farber, Herbst, Kuziemko & Naidu, *supra* note 41, at 1346; Thomas C. Buchmueller, John Dinardo & Robert G. Valletta, *Union Effects on Health Insurance Provision and Coverage in the United States*, 55 INDUS. & LAB. RELS. REV. 610, 615–25 (2002); Hirsch & Schumacher, *supra* note 41, at 209–13; Card, *supra* note 41, at 976–78. *But see* Frandsen, *supra* note 41, at 79–81.

with unionized employers for labor inputs.[91] Strengthening union density will require a suite of labor law reforms that may include (but are not limited to) passage of the Protecting the Right to Organize Act (PRO Act), reforms to ease union recognition, sectoral and supply chain bargaining, "Ghent system" reforms, and worker representation on corporate boards.[92] But empirical evidence supports a number of promising avenues for increasing worker voice under the NLRB's existing authority. This Section proposes tools to more effectively deter employer noncompliance and reverse some contributing causes of union decline. It then offers guidance on interagency coordination that can strengthen those tools and better support labor market institution building to enhance worker voice.

First, the NLRB has adjudicated the legality of a range of employer practices alleged to interfere with workers' attempts to unionize and collectively bargain without drawing from or relying on empirical studies regarding their decisions' effects on worker power.[93] The empirical literature now more clearly shows the adverse effects of employer conduct on unionization efforts, justifying overturning prior NLRA interpretations as inconsistent with its equal–bargaining power purpose. The most promising candidates for review based on the literature are: employer use of mandatory "captive audience" meetings in their anti-union drives,[94] allowing worker demonstration of majority support through card-

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[91] *See, e.g.*, Nicole M. Fortin, Thomas Lemieux & Neil Lloyd, *Labor Market Institutions and the Distribution of Wages: The Role of Spillover Effects* 3–12 (Nat'l Bureau of Econ. Rsch., Working Paper No. 28375, 2021); Patrick Denice & Jake Rosenfeld, *Unions and Nonunion Pay in the United States, 1977–2015*, 5 SOCIO. SCI. 541, 551–52 (2018); Bruce Western & Jake Rosenfeld, *Unions, Norms, and the Rise in U.S. Wage Inequality*, 76 AM. SOCIO. REV. 513, 524–33 (2011).

[92] Marinescu & Rosenfeld, *supra* note 6, at 36–40 (collecting proposals).

[93] *See* Hafiz, *Structural Labor Rights*, *supra* note 3, at 683–88.

[94] For workers' right to refrain from captive audience meetings, see Jennifer A. Abruzzo, *Memorandum GC 22-04*, NLRB OFF. OF GEN. COUNS. (Apr. 7, 2022), https://perma.cc/4KC2-R7S7. Between 1999 and 2003, employers held captive audience meetings in 89% of union election campaigns. *See* Kate Bronfenbrenner, *No Holds Barred: The Intensification of Employer Opposition to Organizing*, ECON. POL'Y INST. 9–12, 10–11 Table 3 (May 20, 2009), https://perma.cc/YWC5-PRWX. Union win rates in elections without captive audience meetings were 73% compared to 47% when management required such meetings. *Id.* For corporate financing of anti-union consultants, see Gordon Lafer & Lola Loustaunau, *Fear at Work: An Inside Account of How Employers Threaten, Intimidate, and Harass Workers to Stop Them from Exercising Their Right to Collective Bargaining*, ECON. POL'Y INST. 8–20 (July 23, 2020), https://perma.cc/T8Q9-XT95.

check recognition to trigger employer collective bargaining duties,[95] and adopting a more expansive definition of "employee" to avoid employer "independent contractors" misclassification of employees.[96] Finally, the Board might seek more expansive penalties—such as consequential damages for economic losses employees suffered due to employers' unfair labor practices—based on empirical evidence of the limited deterrence value of standard penalties like notice posting, back pay, or reinstatement.[97] These remedies could include more aggressive use of bargaining orders to overcome employer delays in reaching a first collective bargaining agreement that reduce worker voice.[98]

Second, while there are a number of contributing causes to union-density decline in the private sector, some include workplace restructuring, the "gigification" of the workforce, and low

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[95] For workers' right to union recognition through card check, see Jennifer A. Abruzzo, *Memorandum GC 21-04*, NLRB OFF. OF GEN. COUNS. (Aug. 12, 2021), https://perma.cc/287H-S6RL. For empirical studies on union success rates through card check as compared to elections with limited adverse coworker or organizer pressure, see generally, for example, Timothy D. Chandler & Rafael Gely, *Card-Check Laws and Public-Sector Union Membership in the States*, 36 LAB. STUD. J. 445 (2011), Adrienne E. Eaton & Jill Kriesky, *NLRB Elections Versus Card Check Campaigns: Results of a Worker Survey*, 62 INDUS. & LAB. RELS. REV. 157 (2009), and Adrienne E. Eaton & Jill Kriesky, *Union Organizing Under Neutrality and Card Check Agreements*, 55 INDUS. & LABOR RELS. REV. 42 (2001).

[96] For prevalence and effects of employee misclassification, see *Independent Contractor Misclassification Imposes Huge Costs on Workers and Federal and State Treasuries*, NAT'L EMP. LAB. PROJECT 2–5 (Oct. 2020), https://perma.cc/9H4E-JWC2. For monopsony evidence of wage penalties due to employer misclassification, see, for example, Weil, *supra* note 3, at 88–91; Dube & Kaplan, *supra* note 41, at 291–93; Matthew Dey, Susan Houseman & Anne Polivka, *What Do We Know About Contracting Out in the United States? Evidence from Household and Establishment Surveys*, 2010 LABOR IN THE NEW ECON. 267, 270–71. For proposed expansion of "employee" status under the NLRA, see Sharon Block & Benjamin Sachs, *Clean Slate for Worker Power: Building a Just Economy and Democracy*, CLEAN SLATE FOR WORKER POWER 25–26 (2020), https://perma.cc/QLX4-4EBP.

[97] *See, e.g.*, Anna Stansbury, *Do US Firms Have an Incentive to Comply with the FLSA and the NLRA?* 30–33 (Peterson Inst. for Int'l Econ., Working Paper No. 21-9, 2021). For the NLRB's expansive remedial authority, see Jennifer A. Abruzzo, *Memorandum GC 21-06*, NLRB OFF. OF GEN. COUNS. (Sept. 8, 2021), https://perma.cc/ZK43-CKMV.

[98] Empirical studies show that employers' appeals of Board orders can delay bargaining by three to five years, and over half of all new bargaining units do not have a first collective bargaining agreement within a year of a union election. *See* Kamala D. Harris & Martin J. Walsh, *White House Task Force on Worker Organizing and Empowerment: Report to the President*, WHITE HOUSE 22 (Feb. 2022), https://perma.cc/WB2F-VXV7; Bronfenbrenner, *supra* note 94, at 22; John-Paul Ferguson, *The Eyes of the Needles: A Sequential Model of Union Organizing Drives, 1999–2004*, 62 INDUS. & LAB. RELS. REV. 3, 5 (2008). For NLRB authority to issue collective bargaining orders, see generally *NLRB v. Gissel Packing Co.*, 395 U.S. 575 (1969).

union density itself increasing employers' incentives to resist unionization to avoid higher labor costs relative to nonunionized employers.[99] By displacing labor and employment law obligations to smaller, less accountable companies, or removing those obligations entirely by misclassifying employees as independent contractors, strong employers have exempted themselves from duties to bargain with workers over compensation or working conditions, reducing workers' ability to assert countervailing leverage over them.[100] Reversing these causes may increase worker power.[101] For example, lowering burdens for workers to engage in enterprise-wide bargaining (like the McDonald's franchise network) by recognizing upstream firms' control over downstream firms' labor costs could expand union density significantly.[102] And expanding worker protections to picket and boycott firms with market power in their employer's product or relevant labor market could increase workers' leverage over their own employer and potentially industry wide.[103]

In addition to redirecting its own authority and resources towards increasing worker power, the NLRB could benefit from and aid interagency coordination to do the same.[104] First, the Board can share its own data, information, and evidence of employer noncompliance as indicators of employer and worker power with other agencies, especially the antitrust agencies. As noted below, employer noncompliance with labor law can be evidence of employer monopsony power and anticompetitive conduct in labor

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[99] Marinescu & Rosenfeld, *supra* note 6, at 27–30.

[100] *See generally* Weil, *supra* note 3, at 10–22.

[101] For the impacts of workplace fissuring on labor law compliance, see Weil, *supra* note 3, at 214–42; Mark Barenberg, *Widening the Scope of Worker Organizing*, ROOSEVELT INST. 11–13 (Oct. 7, 2015), https://perma.cc/6ZYP-6QJR.

[102] For a proposal to implement enterprise bargaining structures in franchising, see Hafiz, *Brand Defense*, *supra* note 3, at 73–74, and *id.* at 65–72 (collecting literature on franchisor control of franchisee labor costs).

[103] *See* Hiba Hafiz, *Picketing in the New Economy*, 38 CARDOZO L. REV. 1845, 1894–1906 (2018). For impact of vertical restraints on labor markets, see Callaci, Pinto, Steinbaum & Walsh, *supra* note 4, at 10–22; Herbert Hovenkamp, *Worker Welfare and Antitrust*, 90 U. CHI. L. REV. (forthcoming 2023),**[LB/RT: Update SYMP piece.]** https://perma.cc/M9R6-L9CV; Tirza J. Angerhofer & Roger D. Blair, *Collusion in the Labor Market: Intended and Unintended Consequences*, COMPETITION POL'Y INT'L, ANTITRUST CHRON., June 12, 2020, at 6; Hafiz, *Brand Defense*, *supra* note 3, 53–71.

[104] The NLRB signed MOUs with the antitrust agencies, enabling information sharing and referrals. *See supra* note 10. For best practices on interagency coordination, see Hiba Hafiz, *Interagency Coordination on Labor Regulation*, 6 ADMIN. L. REV. 199, 225–29 (2021) [hereinafter Hafiz, *Interagency Coordination*].

and product markets. Also, employers who commit labor law violations effectively pay lower wages and put themselves at an advantage relative to their rivals, which can be a competition issue. Evidence of noncompliance or low unionization rates can be red flags to other agencies regarding which labor markets particularly suffer from higher employer power or weaker worker power to inform agency enforcement priorities, instigate referrals and investigations, and use as evidence in enforcement proceedings. The Board's data and enforcement record can also inform antitrust agencies' merger reviews, aiding their evaluation of mergers' labor market effects. For example, the Board can advise the agencies on the successor status of existing unions in the merging firms' labor market(s), conditioning merger approvals on Board-administered elections or card-check recognition, and establishing accelerated, mandatory mediation for resolving unfair-labor-practice disputes or collective bargaining impasses as components of consent decrees and remedies imposed in antitrust cases. The Board's collected data could also aid the antitrust agencies in assessing anticipated effects from mergers based on richer information and context regarding employer and worker bargaining power within respective firms (voice) as opposed to relying merely on evidence of workers' outside options (exit). And the Board could take a more active role in designing consent decrees and remedies for antitrust violations impacting labor markets by advising the antitrust agencies on how to preserve and strengthen worker power in the postremedial environment.[105]

The Board could also benefit from receiving data, information, and analyses from other agencies, especially the antitrust agencies, to inform its own enforcement priorities, supplement investigations, and support evidence in its own enforcement actions, particularly because the statutory ban on Board hiring of economists limits its economic analysis of the relative bargaining power of employers and employees.[106] During their investigations, enforcement actions, and merger reviews, antitrust agencies collect and analyze: market power evidence; labor market concentration evidence; wage and other data from merging employers; evidence of wage fixing, no-poach agreements, and other

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[105] *See, e.g.*, Hiba Hafiz, *Rethinking Breakups*, 71 DUKE L.J. 1491, 1580–92 (2022) [hereinafter Hafiz, *Rethinking Breakups*]. *See generally* Hiba Hafiz, *Interagency Merger Review in Labor Markets*, 95 CHI.-KENT L. REV. 37 (2020) [hereinafter Hafiz, *Interagency Merger Review*].

[106] *See* 29 U.S.C. § 154(a); Hafiz, *Economic Analysis*, *supra* note 36, at 1119–31.

mobility restraints in agreements between employers and in employment contracts and their impacts on labor markets; and the effects of mergers in labor markets.

Data and analyses from the antitrust agencies could aid the Board in its strategic enforcement against employer unfair labor practices as well as with its "joint employer" and "employee" status determinations. First, where the antitrust agencies collect evidence of employer buyer power, anticompetitive conduct in labor markets, or merger-specific labor market effects, their evidence and market power analyses can be used to set or adjust NLRB enforcement priorities to focus on labor markets most in need of government intervention. Second, data and analyses from the antitrust agencies are relevant for Board assessments of whether firms should be understood as "joint employers" or whether labor-input providers should be understood as "employees" rather than "independent contractors" based on a thicker understanding of upstream firms' indirect control over downstream firms' labor demand (hiring) and variable costs (wages as complementary inputs) as well as workers' exit options, or opportunities for profit or loss. The Board may even use evidence of firm wage-setting power, employer collusion, or bargaining leverage in agreements for labor services to presume "joint employer" or "employee" status to upstream firms or purported "independent contractors," expanding the NLRA's duties to collectively bargain and extending protections to organizing workers.[107] But the Board could also use this evidence in determining the scope of employers' protected rights and unfair labor practices to ensure equal bargaining power between employers and employees.[108]

2. Policy priorities to enhance worker exit.

Policy levers strengthening worker power through exit require an interagency approach since an expansive set of labor, antitrust, and other policies shape employers' and workers' outside options. More specifically, the empirical literature points to three priority areas for enforcement and interagency collaboration due to their high potential for effectively increasing worker

[107] *See, e.g.*, Andrew Elmore, Sachin S. Pandya & Kate Griffith, *Rebooting Joint-Employer with Presumptions—A Modest Proposal*, ONLABOR (July 7, 2022), https://perma.cc/6SGS-S32A; Hafiz, *Interagency Coordination*, *supra* note 104, at 232–38; Hafiz, *Structural Labor Rights*, *supra* note 3, at 723–27; Sachin S. Pandya, *What Taft-Hartley Did to Joint-Employer Doctrine*, 25 EMP. RTS. & EMP. POL'Y J. 161, 188–97 (2021).

[108] Hafiz, *Structural Labor Rights*, *supra* note 3, at 711–23.

power: (1) challenging horizontal and vertical agreements that reduce labor market competition, especially workers' mobility restraints; (2) challenging mergers and acquisitions that may substantially lessen competition or tend to create monopsony in labor markets; and (3) strengthening DOL enforcement, especially against employer violations of Fair Labor Standards Act (FLSA) and OSH Act. This Section provides an overview of the empirical literature supporting these policy levers as priorities and outlines mechanisms for interagency coordination that can enhance their effective deployment.

a) Challenging anticompetitive agreements to enhance worker exit. While the antitrust agencies have made clear that certain horizontal agreements between employer competitors—wage fixing, market allocation, bid-rigging, and no-poach agreements—are per se unlawful and even subject to criminal sanction, a number of other horizontal and vertical agreements also limit workers' exit options but are subject to more lenient "rule of reason" review under current law.[109] That means that, to successfully challenge those agreements, enforcers must show employer market power and overcome justifications of those agreements' procompetitive efficiencies, which is a riskier and more costly endeavor. Additionally, persistent legal uncertainty and limited legal precedent guiding labor antitrust adjudication favors selecting cases and enforcement priorities based on empirically strong demonstrations of specific restraints' adverse effects on workers' exit options. Challenging such restraints offers the most promising prospect of increasing worker power.

Leading targets empirically shown to reduce workers' exit options are mobility restraints in agreements between employers and workers, including noncompete clauses that reduce workers' wages without offsetting benefits to workers in the form of training or other considerations.[110] Training-repayment agreements

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[109] *See* U.S. Dep't of Just. & Fed. Trade Comm'n, *Antitrust Guidance for Human Resource Professionals*, U.S. DEP'T OF JUST. 2–5 (Oct. 2016), https://perma.cc/BV2G-HNAK; Eduardo Porter, *A New Legal Tactic to Protect Workers' Pay*, N.Y. TIMES (Apr. 14, 2022), https://www.nytimes.com/2022/04/14/business/economy/wages-antitrust-law-us.html.

[110] *See, e.g.*, Evan P. Starr, J.J. Prescott & Norman D. Bishara, *Noncompete Agreements in the US Labor Force*, 64 J.L. & ECON. 53, 75–77 (2021); Evan Starr, J.J. Prescott & Norman Bishara, *The Behavioral Effects of (Unenforceable) Contracts*, 36 J.L. ECON. & ORG. 633, 660–65 (2020); Matthew S. Johnson, Kurt Lavetti & Michael Lipsitz, *The Labor Market Effects of Legal Restrictions on Worker Mobility*, SSRN 31–37 (Oct. 12, 2021), https://perma.cc/9YP8-ZCB3; Evan Starr, *Consider This: Training, Wages, and the Enforceability of Covenants Not to Compete*, 72 INDUS. & LAB. RELS. REV. 783, 812–14 (2019); Alexander J.S. Colvin & Heidi Shierholz, *Noncompete Agreements*, ECON. POL'Y INST. 1

also limit workers' exit options, and for low-wage workers, may be even more constraining than noncompetes because preventing workers from switching to direct competitors may be less burdensome than requiring workers to pay employers a substantial sum to quit.[111] Nondisclosure agreements can increase information asymmetries between workers and firms, which can increase search costs, and empirical work suggests that legislative limits on their use can increase the availability of underprovided negative information about employers in the marketplace.[112] Similarly, mandatory arbitration provisions and class action waivers can increase information asymmetries between employers and current/future workers regarding employer legal noncompliance because they prevent suit in public fora and require private resolution with undisclosed awards. Arbitration clauses that include class action waivers can reduce workers' bargaining leverage and limit their ability and incentives to assert countervailing power against dominant, colluding, or noncompliant employers. Empirical work suggests that employees win less often and receive lower damages in arbitration than in court while employers may have a repeat-player advantage, winning more cases when they appear before the same arbitrator in multiple cases.[113]

There are a number of horizontal and vertical agreements that raise strong theoretical concerns of decreasing workers' exit options but would benefit from more empirical study. These include information-sharing agreements between employers that facilitate their collusion without reducing information asymmetries between employers and workers. Vertical agreements between employers in fissured workplaces can also limit workers' exit options, including mobility restraints between upstream and downstream firms, product market restraints—like input purchase requirements—that reduce demand for labor downstream

(Dec. 10, 2019), https://perma.cc/LP3J-M3HR; Natarajan Balasubramanian, Jin Woo Chang, Mariko Sakakibara, Jagadeesh Sivadasan & Evan Starr, *Locked In? The Enforceability of Covenants Not to Compete and the Careers of High-Tech Workers*, SSRN 23–25 (Dec. 2019), https://perma.cc/UUW9-5ZK2.

[111] *See* Jonathan F. Harris, *Unconscionability in Contracting for Worker Training*, 72 ALA. L. REV. 723, 737–40 (2021) (collecting studies); Mitchell Hoffman & Stephen V. Burks, *Training Contracts, Employee Turnover, and the Returns from Firm-Sponsored General Training* 19–20 (Nat'l Bureau of Econ. Rsch., Working Paper No. 23247, 2017).

[112] *See* Jason Sockin, Aaron Sojourner & Evan Starr, *Non-Disclosure Agreements and Externalities from Silence* 16–24 (Upjohn Inst. for Emp. Rsch., Working Paper No. 22-360, 2022).

[113] *See* Katherine V.W. Stone & Alexander J.S. Colvin, *The Arbitration Epidemic*, ECON. POL'Y INST. 18–23 (Dec. 7, 2015), https://perma.cc/BA8T-TWF4.

as a complementary input, and restraints that limit downstream employers' demand for labor by reducing their budgetary discretion over all production decisions outside of labor costs.[114]

In targeting agreements for enforcement, antitrust and labor agencies could use a few direct regulatory authorities. First, antitrust enforcers can directly challenge horizontal and vertical restraints through enforcement actions and private litigation. But the FTC can also exercise its rulemaking authority to prohibit or limit the use of such restraints when they reduce labor market competition.[115] And the DOL's OFCCP can prohibit federal contractors from including these restraints in employment agreements with workers or with contracting firms providing labor inputs.

But challenges to agreements that reduce workers' exit options could benefit from more robust interagency coordination. First, the DOL and NLRB can share data and analyses with the antitrust agencies to aid their investigations and enforcement priorities regarding such agreements. Most importantly, they can share evidence indicating strong employer power or weak worker power, including low unionization rates, market definition, and market power evidence necessary in rule of reason cases, like employer legal noncompliance, Standard Occupational Classification (SOC) data, data on labor productivity and costs (to observe whether worker productivity has risen without wages rising), evidence of postmerger mass layoffs where efficiency justifications are weak or lacking (market power evidence), and federal contractor wage data disaggregated by sex, race, ethnicity, and job classification (as evidence of wage discrimination). The labor agencies could also refer worker complaints (and underlying evidence) in their investigations and enforcement actions about the use of such agreements as relevant for antitrust agencies' analyses of unlawful horizontal agreements (to infer agreements in an employer cartel because they limit workers' discovery of the cartel and can police cheating) and unlawful vertical agreements (as conduct with anticompetitive effects). Information sharing and referrals between agencies can institutionalize labor agency cooperation and strengthen a whole-of-government approach to deter

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[114] *See* Angerhofer & Blair, *supra* note 103, at 4–8; Hovenkamp, *supra* note 103, at 32–38; Callaci et al., *supra* note 4, at 16–20.

[115] *See* Rohit Chopra & Lina M. Khan, *The Case for "Unfair Methods of Competition" Rulemaking*, 87 U. CHI. L. REV. 357, 363–65 (2020); Exec. Order No. 14,036, *supra* note 8, at §§ 1, 5(g).

employer noncompliance and alert regulators to issues or facts they might otherwise overlook.[116]

Finally, to close the loop, antitrust agencies gathering evidence of unlawful agreements can share their evidence and analyses with and refer cases to the labor agencies. Such evidence and analyses can aid labor-agency investigations and enforcement priorities, including regarding "employer," "joint employer," and "employee" (as opposed to "independent contractor") status determinations because such evidence is indicative of control over wages and other terms and conditions of employment.

b) Challenging mergers to enhance worker exit. Mounting empirical evidence on labor market concentration places merger policy as another leading policy lever to increase workers' exit options.[117] Labor market concentration reduces the number of firms at which workers can seek employment while increasing firms' incentives to reduce employment and lower wages. While the antitrust agencies have begun reviewing mergers for their labor market effects and may incorporate labor market–effects guidance in revised merger guidelines,[118] they can enhance merger enforcement by incorporating the broader bargaining power indicators we have detailed into merger reviews and improve coordination with labor and other agencies to get a clearer picture

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[116] *See* Hafiz, *Interagency Coordination*, *supra* note 104, at 225–29; Michael M. Oswalt & César F. Rosado Marzán, *Organizing the State: The "New Labor Law" Seen from the Bottom-Up*, 39 BERKELEY J. EMP. & LAB. L. 415, 448–49 (2018).

[117] *See, e.g.*, Gregor Jarosch, Jan Sebastian Nimczik & Isaac Sorkin, *Granular Search, Market Structure, and Wages* 33–35 (Nat'l Bureau of Econ. Rsch., Working Paper No. 26239, 2019); José Azar, Ioana Marinescu, Marshall Steinbaum & Bledi Taska, *Concentration in US Labor Markets: Evidence from Online Vacancy Data*, 66 LABOUR ECON., no. 101886, July 18, 2020, at 2; David W. Berger, Kyle F. Herkenhoff & Simon Mongey, *Labor Market Power* 34–35 (Nat'l Bureau of Econ. Rsch., Working Paper No. 25719, 2021); Prager & Schmitt, *supra* note 7, at 416–18; David Arnold, *Mergers and Acquisitions, Local Labor Market Concentration, and Worker Outcomes*, SSRN 26–33 (Jan. 21, 2020), https://perma.cc/Y2FM-NBGW; *see also* Anna Sokolova & Todd Sorensen, *Monopsony in Labor Markets: A Meta-Analysis*, 74 INDUS. & LAB. RELS. REV. 27, 42–48 (2021) (collecting literature); Alan Manning, *Monopsony in Labor Markets: A Review*, 74 INDUS. & LAB. RELS. REV. 3, 13–15 (2021) (same).

[118] *See, e.g.*, *Federal Trade Commission and Justice Department Seek to Strengthen Enforcement Against Illegal Mergers*, FED. TRADE COMM'N (Jan. 18, 2022), https://perma.cc/W96S-B5WA; Brent Kendall, *Amazon's Planned Purchase of MGM Faces FTC Scrutiny*, WSJ. (June 22, 2021), https://perma.cc/6K8L-RUWQ; Jordan Middler, *FTC's Probe of Microsoft's Activision Acquisition Will Reportedly Focus on Consumer Data, Labour Market*, VIDEO GAMES CHRON. (Apr. 6, 2022), https://perma.cc/6F5A-T8KF.

of a merger's anticipated effects and to inform consent decrees and proposed remedies.[119]

The DOJ's Antitrust Division and the FTC have signed memoranda of understanding (MOUs) with the DOL and NLRB enabling information sharing and referrals, and operationalizing these agreements can improve data collection to report indicators of employer and worker power and strengthen evidence relevant for enforcement.[120] The data and analyses already discussed with regard to unlawful agreements would be relevant for enriched merger review to inform the agencies' market definition, market power, and determinations of unilateral and coordinated effects of mergers on workers' outside options. Specifically, information sharing about provisions in merging parties' labor contracts and firms' history of noncompliance with labor and employment law may signal concerns about postmerger anticompetitive effects in labor markets. Further, information sharing can improve the antitrust agencies' retrospective analyses of mergers' effects in labor markets, including by reviewing data on labor productivity and costs to assess whether the merged firm's monopsony power has increased, whether merger-specific efficiencies have been achieved and workers' shares in the gains from trade have increased, or whether postmerger mass layoffs indicate increased monopsony power when such layoffs cannot be justified by efficiencies.[121]

Merger review evidence could also be relevant to aid labor-agency enforcement. For example, the antitrust agencies could share wage transaction data, critical loss analyses, market power measurements, unilateral and coordinated effects analyses, and analyses of labor-cost reductions to better inform employer- and

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[119] *See* Hafiz, *Interagency Merger Review*, *supra* note 105, at 60–65; Hafiz, *Rethinking Breakups*, *supra* note 105, at 1590–92.

[120] *Memorandum of Understanding Between the U.S. Department of Justice and U.S. Department of Labor*, U.S. DEP'T OF LABOR & U.S. DEP'T OF JUST. 1 (Mar. 10, 2022), https://perma.cc/ERN7-GAHG; *Memorandum of Understanding Between the Federal Trade Commission (FTC) and the National Labor Relations Board (NLRB) Regarding Information Sharing, Cross-Agency Training, and Outreach in Areas of Common Regulatory Interest*, FED. TRADE COMM'N & NAT'L LABOR RELS. BD. (July 19, 2022), https://perma.cc/5KVF-Y8UQ; *Memorandum of Understanding Between the U.S. Dep't of Justice and the National Labor Relations Board*, NAT'L LABOR RELS. BD. & U.S. DEP'T OF JUST. (July 26, 2022), https://perma.cc/PMH2-59QV.

[121] *See Mass Layoff Statistics*, U.S. BUREAU OF LAB. STAT., https://perma.cc/AW82-HM7Q; Omer Arain, *WARN Layoff Data*, WARN DATABASE, https://perma.cc/9SYE-7WBH.

employee-status determinations, misclassification investigations, and contracting arrangements that evidence control over downstream workers.

The MOUs can also better structure interagency involvement and build institutional relationships, enabling longer-term policy coordination, labor-agency input on antitrust agency policy statements and guidance (like the Merger Guidelines and Merger Remedies Manual), and remedial design coordination to condition merger approvals on labor-agency-led compliance solutions and postmerger supervision over both structural and conduct remedies.[122]

c) Strengthening DOL enforcement to enhance worker exit. A final set of critical policy priorities to increase worker voice through exit include more aggressive enforcement to safeguard wage and working-condition floors. First, minimum wage enforcement can increase worker power without decreasing employment when workers are underpaid relative to their marginal productivity, or in labor markets where employers have some level of monopsony over workers.[123] One study estimated that wage theft cost workers in the ten most populous states more than $8 billion in lost earnings.[124] While strong wage-enforcement regimes can work to effectively deter wage theft and employer misclassification of workers, the realities of underenforcement and weak penalties for noncompliance have limited that deterrent effect.[125] Similarly, workplace health and safety standards place a floor on working conditions, are effective at reducing workplace injuries, and have not been found to reduce employment or firm survival.[126] To summarize, then, widespread enforcement improves workers' outside options in these contexts because it ensures that

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[122] *See* Hafiz, *Interagency Merger Review*, *supra* note 105, at 60–65; Hafiz, *Rethinking Breakups*, *supra* note 105, at 1590–92.

[123] *See* Azar et al., *supra* note 15, at 13–15; Doruk Cengiz, Arindrajit Dube, Attila Lindner & Ben Zipperer, *The Effect of Minimum Wages on Low-Wage Jobs*, 134 Q.J. ECON. 1405, 1446–49 (2019).

[124] David Cooper & Teresa Kroeger, *Employers Steal Billions from Workers' Paychecks Each Year*, ECON. POL'Y INST. 1 (May 10, 2017), https://perma.cc/77ZY-E5JU.

[125] Daniel J. Galvin, *Deterring Wage Theft*, 14 PERSP. POL. 324, 331–35 (2016); Stansbury, *supra* note 97, at 5–11; Françoise Carré, *(In)dependent Contractor Misclassification*, ECON. POL'Y INST. 6–8 (June 8, 2015), https://perma.cc/R4YK-KZRK; Lynn Rhinehart, Celine McNicholas, Margaret Poydock & Ihna Mangundayao, *Misclassification, the ABC Test, and Employee Status*, ECON. POL'Y INST. 5 (June 16, 2021), https://perma.cc/MDA2-AJX5.

[126] *See, e.g.*, Marinescu & Rosenfeld, *supra* note 6, at 18; David I. Levine, Michael W. Toffel & Matthew S. Johnson, *Randomized Government Safety Inspections Reduce Worker Injuries with No Detectable Job Loss*, 336 SCI. 907, 910 (2012).

more employers are not paying infracompetitive wage rates or offering inferior working conditions; remaining workers who *do* suffer under such conditions can more easily quit those jobs for better ones, increasing their bargaining leverage with existing employers.

While scholars and advocates have a range of proposals to improve DOL enforcement—from more expansive jurisdiction, more enforcement resources, higher penalties, and strategic enforcement—our focus is on improving enforcement synergies through interagency coordination to support enforcement within DOL but also pool DOL efforts with outside agencies to target repeat violators.

First, as discussed, the DOL could utilize indicators of strong employer power and weak worker power gleaned from other agencies to instigate investigations, set minimum wage and OSHA enforcement priorities, and use in its own enforcement actions to impose joint employer status or protect misclassified workers. These indicators include data and analyses that antitrust agencies could flag that focus specifically on labor market concentration, employer dominance, and employers' anticompetitive conduct in low-wage labor markets and hazardous industries.

But the DOL could share its own data, analyses, and enforcement record with the NLRB and the antitrust agencies to create a unified approach to expand workers' exit options in labor markets where worker power is weakest. The agency could share information about its investigations and employer noncompliance as evidence of market power and to aid in antitrust-agency merger reviews as evidence of existing monopsony power (or the limits of workers' countervailing power).

CONCLUSION

A whole-of-government approach can significantly strengthen worker power. The framework and indicators we develop here are a first step towards increasing agencies' capacity to target some of the most critical and reversible challenges to worker voice and exit. But certainly, more work is required. More empirical work is necessary to not only assess the effectiveness of a wider range of policy levers that can increase worker power but also to assess the impacts of agency action and inaction on workers' relative bargaining power. Further, qualitative assessments of obstacles to interagency coordination will be critical for secur-

ing agency-wide buy-in to operationalize collaboration that furthers worker power goals. And ensuring both executive and congressional oversight is critical to gauge whether agency efforts are effective in strengthening worker power through interagency task forces, White House, Treasury Department, and Office of Information and Regulatory Affairs review, and continued study through congressional hearings and commissioned reports. Finally, worker power can be increased by expanding interagency coordination tools and levers to integrate antitrust and labor-agency regulation with agencies that regulate monetary policy, social insurance design and distribution, and other sources of personal wealth enabling worker exit.

ATTACHMENT #5

California Nurses Association, Supplemental Comments

to the California Law Revision Commission

Antitrust Law - Study B-750, Mergers and Acquisitions

Scheffler R, Arnold D, and Whaley C (2018), "Consolidation Trends In California's Health Care System: Impacts on ACA Premiums and Outpatient Visit Prices," *Health Affairs*, 37(9): 1409-16, https://www.healthaffairs.org/doi/full/10.1377/hlthaff.2018.0472.

By Richard M. Scheffler, Daniel R. Arnold, and Christopher M. Whaley

Consolidation Trends In California's Health Care System: Impacts On ACA Premiums And Outpatient Visit Prices

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HEALTH AFFAIRS 37,
NO. 9 (2018): 1409–1416

ABSTRACT **California has heavily concentrated hospital, physician, and health insurance markets, but their current structure and functioning is not well understood. We assessed consolidation trends and performed an analysis of "hot spots"—markets that potentially warrant concern and scrutiny by regulators in terms of both horizontal concentration (such as hospital-hospital mergers) and vertical integration (hospitals' acquisition of physician practices). In 2016, seven counties were high on all six measures used in our hot-spot analysis (four horizontal concentration and two vertical integration measures), and five counties were high on five. The percentage of physicians in practices owned by a hospital increased from about 25 percent in 2010 to more than 40 percent in 2016. The estimated impact of the increase in vertical integration from 2013 to 2016 in highly concentrated hospital markets was found to be associated with a 12 percent increase in Marketplace premiums. For physician outpatient services, the increase in vertical integration was also associated with a 9 percent increase in specialist prices and a 5 percent increase in primary care prices. Legislative proposals, actions by the state's attorney general, and other regulatory changes are suggested.**

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Increases in the market concentration of health care providers and insurers have been examined nationally.[1–3] Studies suggest that increases in market concentration are associated with increases in prices and premiums.[2–12] However, we also know that the local markets for health care differ dramatically. At the state level, laws and regulations, as well as the mix of providers and insurers, make markets in each state vastly different.

The health care system in California has several characteristics that distinguish it from the rest of the country.[13] The state contains some of the nation's most densely populated urban areas, but it is mostly rural. Its health care system has a high level of integration and managed care. More than 60 percent of care is provided through a fully or highly integrated care system.[14–16] The supply of doctors and nurses in California is slightly above national averages. For example, California has 380 physicians per 100,000 population, whereas the US has 295 per 100,000.[17] Although per capita health care spending in California was the fifteenth-lowest in the US in 2014,[18] it has been increasing—in large part because of the successful implementation of the Affordable Care Act (ACA) in California.[15]

This article explores three features of California health care markets. First, we measure trends from 2010 to 2016 in the horizontal concentration of insurers and providers (such as hospital-hospital mergers and acquisitions) and vertical integration—particularly, ownership of physician practices by hospitals. Second, we estimate the association of market concentration and vertical integration with ACA Marketplace premi-

ums and outpatient office visit prices. Finally, we discuss policy implications for California's Office of the Attorney General, the legislature, and other regulators in the state.

Study Data And Methods

DEFINING MARKET CONCENTRATION AND MARKET SHARE We measured market concentration by computing Herfindahl-Hirschman Indices (HHIs) for insurance, hospitals, primary care physicians, and specialist physicians in California. For each measure, we calculated these HHIs by summing the squared market shares of firms. For example, if a market included two firms, one with 80 percent of the market and the other with 20 percent, the HHI of the market would be 6,800 (or 80^2 plus 20^2). The Horizontal Merger Guidelines of the Department of Justice (DOJ) and Federal Trade Commission (FTC) consider markets with HHIs below 1,500 to be unconcentrated, those with HHIs of 1,500–2,500 to be moderately concentrated, and those with HHIs above 2,500 to be highly concentrated.[19] In the context of mergers, the DOJ/FTC guidelines state, "Mergers resulting in highly concentrated markets that involve an increase in the HHI of more than 200 points will be presumed to be likely to enhance market power."[19] Both mergers in moderately concentrated markets that would lead to an increase in the HHI of more than 100 points and mergers in highly concentrated markets resulting in an increase in the HHI of 100–200 points "potentially raise significant competitive concerns and often warrant scrutiny," according to the guidelines.[19]

Our market shares for hospitals included only short-term general hospitals.[20] Additionally, we treated hospital systems as a single firm because they bargain with insurers as a single unit.[21] We calculated the market share of hospitals and health insurers using inpatient admissions and commercial enrollment (for both fully and self-insured employer groups), respectively. For specialist and primary care groups, we calculated market shares using the number of physicians in each group. Physician organizations owned by a group medical practice, hospital, or health care system (which always included at least one hospital) were treated as a single firm. Our measure of specialist market share included four specialties—cardiology, hematology/oncology, orthopedics, and radiology. These four specialties were chosen because the sample sizes were sufficiently large (at least 10,000 physicians nationally) in our physician data source. Data sources used to calculate these measures included the American Hospital Association (AHA) Annual Survey Database, for hospitals; the Managed Market Surveyor provided by Decision Resources Group (formerly HealthLeaders-Interstudy), for health insurers; and the SK&A Office Based Physicians Database provided by QuintilesIMS, for physicians (this data source is now known as IQVIA). We measured the level of vertical integration as the percentage of physicians in practices owned by hospitals.[22] We chose to use the SK&A database instead of the AHA database to measure the level of vertical integration because the former provides a more conservative estimate (by 4 percentage points) of the number of physicians in hospital-owned practices, according to a recent study.[23]

ANALYSIS Using multivariate linear regression, we estimated the association between Marketplace premiums and our measures of horizontal concentration and vertical integration in the market, using data for 2014–17 on premiums from the Covered California website.[24] We analyzed the benchmark premiums—those for the second-lowest-cost silver plan in each rating area—for a forty-year-old person. Rating areas are counties or combinations of counties in California through which Covered California sells health insurance. There were nineteen rating areas established by the California State Legislature in September 2013. Because the premiums available were at the rating area level, we correlated them with rating area–level HHIs (that is, we used rating area–level market shares in HHI calculations) rather than county-level HHIs.

The dependent variable in our model was the benchmark premium for a forty-year-old person in a rating area for a particular year. The independent variables in the model were the natural log of hospital HHI (mean centered), the percentage of all physicians in practices owned by hospitals (mean centered), an interaction term between these two measures, the natural log of insurer HHI, the natural log of the average weekly wage in rating areas, and year dummy variables to control for secular trends. All market concentration measures were lagged by one year because Marketplace premiums are set prospectively. There were seventy-six observations in the regression (nineteen rating areas multiplied by four years, 2014–17).

In separate regressions, we also estimated the association between market concentration and physician prices, separately for primary care physicians and specialists. The physician prices we analyzed came from medical claims data for 2011–16 collected from self-insured employers from multiple industries, including professional services, retail, local government, technology, and manufacturing. The database we used contained 70.9 million California claims for 2011–16 and included data for every county in the state.

From the claims data, we identified all procedures performed in an office-based setting by primary care physicians and specialists. For each procedure, identified by *Current Procedural Terminology* (CPT) codes, we calculated the mean price per procedure in each county and year. These prices represented the market-level prices used as the dependent variable in our model.

We then examined the association between market concentration and office visit prices using the log-transformed county-level price for each procedure and year, which allows for a percentage interpretation of our results. To measure market concentration, we used the log-transformed primary care physician or specialist HHI, the log-transformed insurer HHI, and the percentage of physicians (either primary care or specialists) in practices owned by a hospital. All market concentration measures were lagged by one year. We included fixed effects for CPT code, county, and year.

LIMITATIONS The study had several limitations. First, we could not rule out potential endogeneity or omitted variable bias between concentration/integration and prices/premiums. While our price regressions used CPT code, county, and year fixed effects to ameliorate concerns of omitted variable bias, our Marketplace premium model included year fixed effects only. And while lagging our concentration measures by a year should have helped reduce the concern of endogeneity, it did not eliminate the possibility.

Second, we report results for a single state. As we stated above, California's health care market differs from those of other states in a number of ways. Hence, our results might not be generalizable to other states. Finally, we did not measure the effects of integration on quality and utilization.[25] If care were more expensive while also more comprehensive, overall utilization and spending could decrease as prices increase.

Study Results

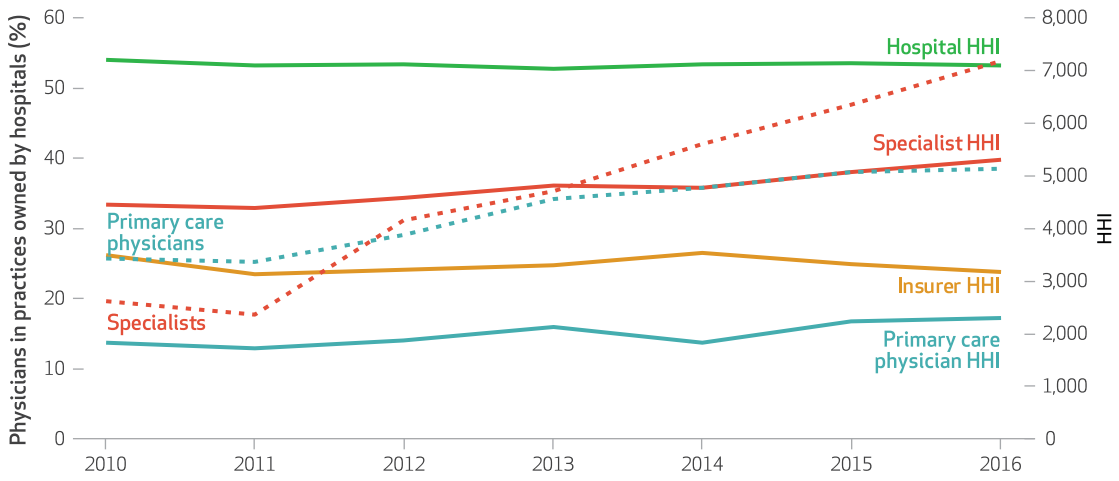
Hospitals in the forty-one counties with populations of less than 500,000 were highly concentrated during the entire study period (exhibit 1), with an average HHI of more than 7,000. (See online appendix figures A2–A4 for results for other counties.)[26] The insurer market was also highly concentrated, with an average HHI of more than 3,000 during the study period. For physician markets, the specialist HHI was more than 5,000, while the primary care physician HHI was just under 2,300 (exhibit 1).

There was a dramatic increase in vertical integration, with the percentage of physicians in practices owned by hospitals increasing from about 25 percent in 2010 to more than 40 percent by 2016 (data not shown). The percentage of primary care physicians in practices owned by hospitals increased from 26 percent to 38 percent in this time period, while the percentage of specialists in such practices increased from 20 percent to 54 percent (exhibit 1).

We also examined the average trends in hori-

EXHIBIT 1

Horizontal concentration and vertical integration in selected California counties, 2010–16



SOURCE Authors' analysis of data for health insurers from the Managed Market Surveyor provided by Decision Resources Group (formerly HealthLeaders-Interstudy), for hospitals from the American Hospital Association Annual Survey Database, and for physicians from the SK&A Office Based Physicians Database provided by QuintilesIMS. **NOTES** Herfindahl-Hirschman Indices (HHIs) indicate market concentration and are explained in the text. The figure shows unweighted data for forty-one California counties with populations of less than 500,000. Specialists include physicians in the fields of cardiology, oncology, radiology, and orthopedics. The dashed lines refer to percentages of primary care physicians and specialists in practices owned by hospitals.

zontal concentration and vertical integration for all counties, calculated at the county level and weighted by the population of each county to produce a statewide weighted average (appendix figure A1).[26] The population-weighted HHI for insurers was the highest among all of the horizontal measures (about 2,400), with virtually no change over the study period. The population-weighted HHI for hospitals was slightly lower and also showed little change. Most of the hospital and insurer consolidation in California took place before our study period.[27] The population-weighted HHIs for specialists and primary care physicians increased by 17 percent and 19 percent, respectively, in the period but remained below 1,500. The statewide average level of vertical integration, as measured by the percentages of physicians in practices owned by hospitals, increased at a rate similar to that for the forty-one counties with populations of less than 500,000.

To analyze levels of and changes in market concentration, we constructed a map of "hot spots"—markets that potentially warrant concern and scrutiny by regulators in terms of both horizontal concentration and vertical integration (exhibit 2). It should be noted that our vertical integration threshold is not codified in the DOJ/FTC guidelines, as the horizontal concentration threshold is.

Only two counties had a market concentration score (or "hot spot rating") of 6 in 2010. This increased to seven counties in 2016 (see appendix table A1 for a list of all counties and appendix figure A5 for a map of counties by name).[26] Similarly, only two counties had a score of 5 in 2010, compared to five counties in 2016.

We measured increases in the horizontal concentration and vertical integration scores. (Appendix figure A6 summarizes and displays the changes in our hot-spot map.)[26] For horizontal concentration, an increase in the score was recorded if the county had an HHI above 2,500 and a change in HHI that was greater than 200 points—in line with the DOJ/FTC Horizontal Merger Guidelines. For vertical integration, an increase in the score was recorded if the county went from below the median value in 2010 to above it in 2016.[28] During this period, out of a maximum score of 6, the highest score was 4. This indicates that the county's horizontal concentration or level of vertical integration increased on four of the six measures.

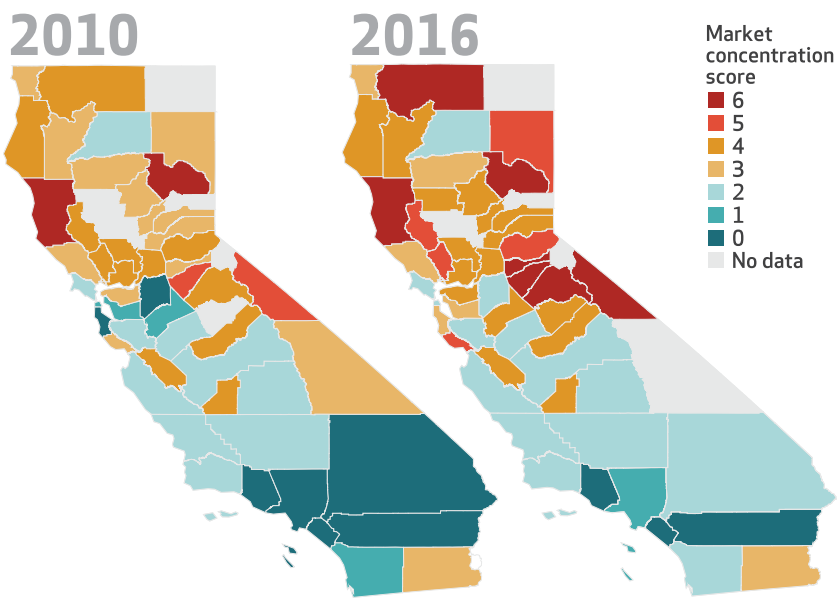
Four counties—Amador, El Dorado, Santa Cruz, and Siskiyou—each had a score of 4, which indicates that they had had the greatest change in terms of our six measures (appendix figure A6).[26] Of additional concern are the six counties—Calaveras, Humboldt, Kings, San Mateo, Stanislaus, and Tuolumne—that had a score of 3.

Appendix table A2[26] reports the results of our analysis of the relationship between benchmark Marketplace premiums and our measures of horizontal concentration and vertical integration. Our results suggest that hospital concentration was positively associated with Marketplace premiums. A 10 percent increase in the market concentration of hospitals was associated with a 1.8 percent increase in premiums; this is expressed as an elasticity of 0.182. Our measure of insurer concentration was also positively associated with premiums. The elasticity of 0.204 indicates that a 10 percent increase in insurer concentration was associated with a 2.0 percent increase in premiums. Importantly, the interaction term between hospital concentration and the level of vertical integration was positive and significant ($p < 0.05$). This means that the association between hospital concentration and premiums was larger when a high percentage of the physicians in a rating area were working in practices owned by hospitals.

The association between hospital concentra-

EXHIBIT 2

Horizontal concentration and vertical integration scores for selected California counties, 2010 and 2016



SOURCE Authors' analysis of data sources provided in exhibit 1. **NOTES** Each county has a market concentration score based on six measures: the average Herfindahl-Hirschman Indices (HHIs) (explained in the text) for hospitals, insurers, primary care physicians, and specialists; and the percentages of primary care physicians and specialists (explained in the notes to exhibit 1) working in practices owned by hospitals. Higher index values indicate greater concentration. Counties are assigned one point for each HHI greater than 2,500 and for the percentage of primary care and specialist ownership greater than 33.23 percent and 32.35 percent, respectively (the medians for the period 2010–16). Higher scores indicate greater market concentration. The scores can also be interpreted as a thermal gradient, with the cool colors indicating counties that warrant lower concern and scrutiny by regulators and the hotter colors indicating counties that warrant increasingly more.

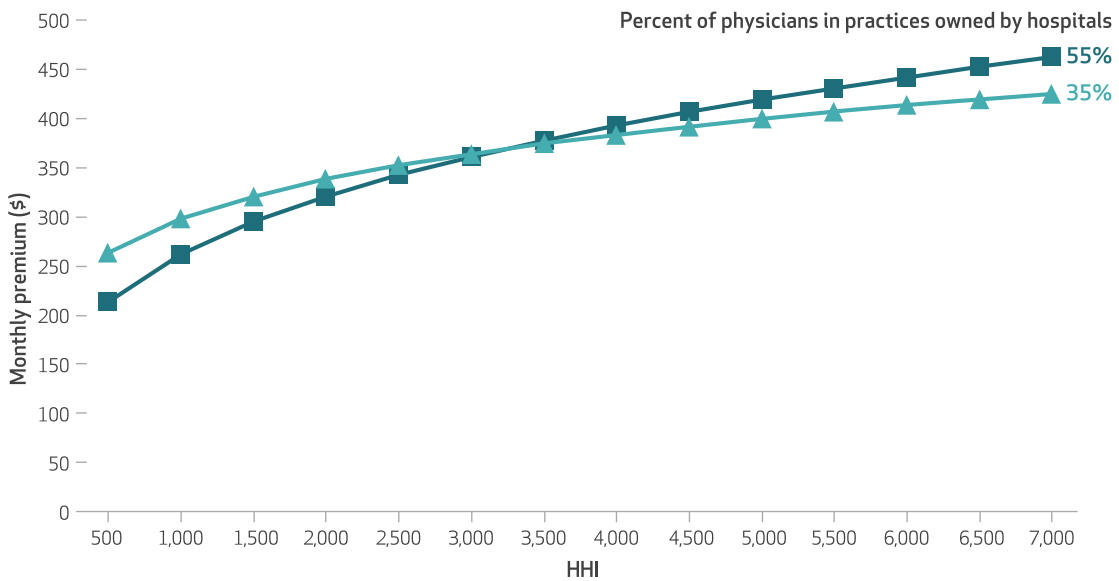
tion, the level of vertical integration, and Marketplace premiums is highlighted in exhibit 3. At a hospital HHI of 3,500, the predicted average monthly Marketplace premium for a forty-year-old person was about $375 in 2017. When the hospital HHI increased to 5,000, the predicted premium rose to about $400 (a 7 percent increase) if the percentage of physicians in practices owned by hospitals was 35 percent (the sample mean). If this percentage was 55 percent (the sample maximum), the predicted average monthly premium increased by even more—to about $419 (a 12 percent increase). This suggests that the association between hospital HHI and premiums varies with the percentage of physicians in practices owned by hospitals (an interaction effect) and that the impact of hospital concentration on premiums becomes larger as vertical integration increases.

Turning to the association between market concentration and physician prices, we found that higher levels of insurer concentration were associated with lower primary care prices (see appendix table A3 for the regression output).[26] Primary care physician concentration, however, was positively associated with prices. Most important, we found a positive and highly significant ($p < 0.01$) relationship between the level of vertical integration and primary care prices. Our results for specialist prices were somewhat different. We found no association between the concentration of insurers or specialists and specialist prices. However, there was again a positive and highly significant ($p < 0.01$) relationship between the level of vertical integration and specialist prices.

The positive relationship we found between vertical integration and physician prices aligns with the findings of other studies.[3,4] The magnitude of is relationship is shown in exhibit 4. When the percentage of specialists in practices owned by hospitals was 35 percent (the county-level sample mean over our study period), the predicted specialist price in 2017 was about $110. When the percentage increased to 100 percent (the county-level sample maximum over our study period), the predicted specialist price increased to about $120—a 9 percent increase. When the percentage of primary care physicians in practices owned by hospitals increased from 33 percent (the county-level sample mean over our study period) to 100 percent (the county-level sample maximum), the predicted primary care price in 2017 increased from about $80 to $84—a 5 percent increase.

EXHIBIT 3

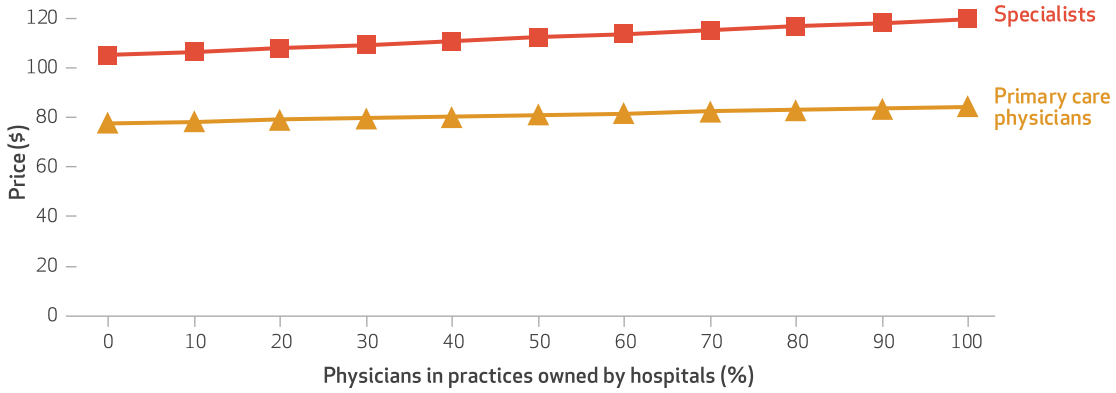
Predicted monthly benchmark premiums in California, by hospital market concentration, and physicians in practices owned by hospitals (maximum and mean), 2017



SOURCE For health insurers, authors' analysis of data sources provided in exhibit 1; for premiums, authors' analysis of data from Covered California. Data and research [Internet]. Sacramento (CA): Covered California; [cited 2018 Aug 21]. Available from: http://hbex.coveredca.com/data-research/. **NOTES** The benchmark premium is the premium for the second-lowest-cost silver plan in each rating area (explained in the text) for a forty-year-old person. HHI is Herfindahl-Hirschman Index (explained in the text). The regression coefficients used to produce this exhibit are in appendix table A2 (see note 28 in text). All continuous independent variables not shown in the exhibit were held at their sample means, and the year dummy variable was set to 2017.

EXHIBIT 4

Predicted outpatient office visit prices for primary care and specialist physicians, by percent of physicians in practices owned by hospitals, 2016



SOURCE For health insurers, authors' analysis of data sources provided in exhibit 1; and for prices, data obtained from a large group of self-insured employers. **NOTES** The regression coefficients used to produce this exhibit are presented in appendix table A3 (see note 28 in text). All continuous independent variables not shown in the exhibit were held at their sample means, the year dummy variable was set to 2016, and the county fixed effect was set to San Francisco.

Discussion

The most dramatic changes in hospital, physician, and insurer markets in California from 2010 to 2016 are seen most clearly in our measures of vertical integration—the percentages of primary care physicians and specialists in practices owned by hospitals. In 2016 more than 40 percent of physicians worked for practices owned by hospitals. Hospitals' desire to increase referrals has been advanced by researchers as a plausible explanation for why they pursue acquiring physician practices.[3,29,30] Additionally, physicians working in a hospital-owned practice can add a hospital facility fee, which raises prices.[31] Although there was little change in the market concentration of insurers and hospitals during our study period, both were highly concentrated according to the DOJ/FTC Horizontal Merger Guidelines and warrant high levels of concern and scrutiny by regulators. Any further consolidation, either horizontal or vertical, may need to be carefully examined.

There was significant variation in market concentration across the fifty-eight counties in California. Our hot-spot analysis shows that certain counties were high on all six measures of horizontal concentration and vertical integration. Moreover, some of these counties had an HHI increase of more than 200, which signals the need for regulatory scrutiny. This information can be used by California's Office of the Attorney General, the legislature, and other regulators to examine further consolidations and other actions that might increase market concentration or vertical integration.

An important result of our analysis is the combined effect of hospital concentration and vertical integration on Marketplace premiums. Hospital concentration was positively associated with premiums, and the impact of hospital concentration on premiums became larger as vertical integration increased.

Our measure of vertical integration, the percentage of physicians in practices owned by hospitals, was positively and significantly correlated with primary care and specialty physician prices. This suggests that increased and special attention should be given to the acquisition of physician practices by hospitals in California.

Such acquisitions are not California-specific: From 2010 to 2016 the national share of office-based physicians who worked in organizations owned by hospitals increased from 30 percent to 48 percent.[32] Other states have already taken regulatory actions to address this trend. One such action is taking place in Washington State, where the State Attorney General's office filed suit against Franciscan Health System to unwind acquisitions of and affiliations with physician organizations that allegedly violated antitrust laws and harmed consumers via anticompetitive health care prices.[33] The results of the St. Luke's case in Idaho are also relevant.[34] In this case, the judge took into account the benefits of vertical integration but found that the hospital's purchase of physician practices would give the hospital too much market power. Instead of allowing the hospital to purchase practices, he suggested that the benefits of vertical integration could be achieved by contracting, which would give the other hospitals in the area the ability to work with these physicians as well.

What can be done in the California legislature to deal with the effects of market concentration and integration on health care prices and premiums? Three important bills have been introduced in the legislature but have not yet passed. The first is SB-932 (2016), which proposes that any merger or consolidation would need to be approved by the director of the California Department of Managed Health Care and involve public hearings to ensure that the change would not have adverse effects on competition, health care costs, access, or quality of care in the state. SB-932 would also prevent hospitals from making anticompetitive demands when negotiating with health plans and insurers.[35] More recently, AB-595 (2017) would similarly require the director to review and approve health care plan or provider mergers based on whether they would have adverse effects on competition, health care costs, access, or quality of care.[36] Finally, SB-538 (2017) focuses on preventing anticompetitive practices among large hospital chains by instituting new rules for how hospital systems can contract with health plans, such as prohibiting hospital systems from requiring plans to include all of a system's hospitals in a contract.[37]

California's health care markets are at a pivotal point. Rapid integration and consolidation may have significant benefits. Care coordination and quality improvement are possible, but so are significant increases in the cost of care.[38] There is also a large variation in quality across California, as measured by the California Regional Health Care Cost and Quality Atlas.[39] It would be very useful to understand the relationship between quality and market concentration. Evidence provided by our study sheds light on what has been happening in California's health care markets. Our work highlights areas that should be of concern to regulators, policy makers, payers, and consumers.

Conclusion

Three aspects of hospitals' acquisition of physician practices in California and across the country are notable. First is the horizontal aspect of this consolidation, which needs to be scrutinized. For example, if a hospital system controls the market for orthopedists, it can raise prices for orthopedic surgery. Second is the cross-market power in hospital and physician service markets. For example, if a dominant hospital system acquires enough physician practices in a specialty, it can add significantly to its market power. Finally, the key and perhaps most important competitive threat is the ability of the acquiring hospital system to either foreclose rivals or significantly increase their costs. For example, lack of access to the patients of an acquired primary care practice by a rival hospital would be a vertical restraint that would limit competition.

The potential impact of hospitals' acquisition of physician practices calls for careful and detailed examination.[40] Improved economic and legal theories need development so that these acquisitions' potential efficiency and quality improvement can be weighed against the costs.[41,42] ■

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The Economics Case for the Consumer Welfare Standard in Antitrust

Tom Campbell

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13 min read

Antitrust

Summary

- Tom Campbell argues that the consumer welfare standard is superior to non-economic neo-Brandeisian factors that the FTC and DOJ currently advocate.

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The consumer welfare standard in antitrust has strong economic underpinnings, and revisiting them demonstrates how that standard can be applied with simplicity and clarity. This illustrates its superiority over the non-economic neo-Brandeisian factors that the Federal Trade Commission ("FTC") and U.S. Department of Justice Antitrust Division ("DOJ") currently advocate.

The Debate Over the Consumer Welfare Standard in Antitrust

Sherman Act monopolization, Robinson-Patman price-discrimination, and merger enforcement all require some version of proving harm to competition. 1

Some academics have argued that the goals of antitrust should go beyond harm to competition, taking into account other considerations for which normative objectives are

debatable, such as political power, protection of small firms, income disparity, supporting labor, and other social goals. 2

Professor Hovenkamp has observed that "Proponents, some of whom are referred to as 'neo-Brandeisians' (after Supreme Court Justice Louis Brandeis), often regarded low prices as an undesirable outcome, at least when they come from large firms at the expense of higher cost, smaller rivals. Overall, the movement is not enthusiastic about the use of economics in antitrust and appears to believe that economics should either be subordinated to political priorities or abandoned entirely." 3

The current antitrust enforcement authorities are on a mission to have courts vindicate social goals through antitrust statutes. The FTC 2022 Policy Statement declared that the "legislative record demonstrates that Congress enacted Section 5 to protect against various types of unfair or oppressive conduct in the marketplace" and that "Congress evinced a clear aim that 'unfair methods of competition' need not require a showing of current anticompetitive harm or anticompetitive intent in every case." 4

Gregory Werden described this approach as having been "intended to knock down any walls that might cabin the FTC's enforcement, rather than to map its boundaries." 5

The difficulty with these non-economic alternatives is their lack of guidance for assessing practices that point in different directions. A good example is the approach taken by the antitrust enforcement agencies on labor. President Biden has characterized himself as the most pro-union President in history. 6

Supporting employees over employers is a social goal not necessarily consistent with economic efficiency. Indeed, forming a monopoly of an input is explicitly identified as a negative in the 2023 Merger Guidelines ("2023 MGs"): "if a merger may substantially lessen competition or tend to create a monopoly in upstream markets, that loss of competition is not offset by purported benefits in a separate downstream product market." 7
Favoring a monopoly of an input undermines economic efficiency. Outside of the statutory and nonstatutory exemptions from the antitrust laws for the formation and operation of labor unions, 8
it also contradicts traditional antitrust doctrine. 9

Seemingly in synch with the social objective of siding with labor, President Biden's antitrust appointees at DOJ and the FTC announced, for the first time, that an increase in employers' relative bargaining power vis-à-vis workers would be a negative factor in evaluating a merger, explicitly downplaying the fact that if the final product market is competitive, lowering labor costs will benefit ultimate consumers. 10

This tension was recently illustrated in the FTC's complaint against the proposed merger of two stylish handbag manufacturers, based in part on concern that salespersons and other employees might see their wages drop. As an economic matter, it is highly implausible that employees selling Coach, Kate Spade, and Michael Kors handbags would suffer lower wages because those brands merged. There are hundreds of other handbag outlets and department stores for whom these employees could work. Hence, though couched in terms of the risk that the merger would enhance employer monopsony power, the FTC's inclusion of this count in the complaint is more plausibly

explained by a non-economic factor—a desire to show a governmental concern for employees. 11

How much this preference for labor should influence merger enforcement decisions is impossible to measure. For example, should America anticipate more agency opposition to a unionized automotive plant being acquired by a nonunionized automobile manufacturer than the reverse, even when market shares and all other economic factors are identical?

In this debate, clarity and ease of administration disfavor a set of neo-Brandeisian factors that might point in different directions. By contrast, the consumer welfare standard is clear and easy to apply.

Total Welfare Standard or Consumer Welfare Standard?

Economics defines social welfare as the value of a good or service in excess of what it costs to produce that good or service. This is the familiar "welfare triangle." Social welfare is the sum of consumers' surplus (the value consumers place on a good over the price they must pay for the good) and suppliers' surplus (profit). 12

If social welfare is the correct concept to apply to "harm to competition" in the antitrust context, then antitrust courts would have a clear test to apply. The government, or private plaintiff, would have to show that a practice has caused (or in the case of mergers, is likely to cause) a drop in output or an increase in price. Depending on burden of proof, this test could also be expressed as an affirmative defense by a business or individual accused of an antitrust violation. If the defendant could show that the challenged practices have led to output growing and price dropping, that would be sufficient to show social welfare had increased.

Suppose a practice increases profit but *diminishes* consumers' surplus. If the measurement of the former exceeds the measurement of the latter, total societal welfare would have grown. The DOJ/FTC's 1992 Merger Guidelines originally recognized this, permitting a possible defense upon showing cost savings from a merger, without requiring that consumers benefited. 13

The 1997 Guidelines even more explicitly recognized that "efficiencies may result in benefits even when price is not immediately and directly affected." 14
The 2023 Guidelines, however, have now changed: cost savings that only increase profit, rather than reduce prices, are not sufficient as procompetitive efficiencies. "To the extent efficiencies merely benefit the merging firms, they are not cognizable." 15

Distinguishing between business practices that increase total economic welfare and those that increase consumers' surplus might seem to present a complexity in applying the "consumer welfare standard." Indeed, the very phrase "consumer welfare standard" confuses total economic welfare with consumers' surplus. 16

Robert Bork appears to have made that error. 17

Hovenkamp has observed that for Bork, "'consumer welfare' referred to the sum of the welfare, or surplus, enjoyed by both consumers and producers, or perhaps even by all of society." 18

Hovenkamp proposed simply using "consumers' surplus." 19

As he explains:
'Consumer welfare' as it is properly used today refers to the welfare of consumers-as-consumers, pure and simple. Speaking objectively, consumer welfare is improved by high output and low prices, as well as high quality. . . . But misunderstandings about definition–often the result of confusing the consumers' and general welfare standards—have complicated the debate about how to improve antitrust policy and have affected even Supreme Court usage of the term. The Supreme Court has never categorically embraced any particular definition of consumer welfare, even though it has used the term several times. 20

Professors Joseph Farrell and Michael Katz, by contrast, after exhaustive analysis, favored total welfare. According to these authors, "We believe that there is a strong case for using total surplus, together with appropriate non-welfarist process criteria, as the overall objective of antitrust policy—and arguably even the process element earns its place through the view that competition promotes total surplus." 21

Richard Schmalensee and Hal Varian also used total welfare, 22

as have other economists. 23
In contrast, Simon Cowan has argued: "There are several reasons to consider the effect on consumers' surplus on its own. Anti-trust agencies sometimes use consumer surplus, rather than total welfare, as the standard. The monopolist might be owned by foreigners, so its profits would normally be excluded from the measure of domestic welfare." 24

A review of the economic origins of the total economic welfare measure shows that the Supreme Court does not have to choose between these two standards. (In fact, it never has done so.) 25

As will be shown below, there are strong conditions sufficient to show an increase in total economic welfare will also yield an increase in consumers' surplus.

Price discrimination

If a practice increases total output and lowers price, consumers are benefited. So the case that needs exploration is where a challenged practice increases total output but also increases price, at least for some consumers. This circumstance arises in the case of price discrimination.

Price discrimination is not exclusive to Robinson-Patman Act 26

cases. Price discrimination is often effectuated by tying one product or service to another, where the tied product serves as a measure of use, or as a means of separating elasticities of demand by consumers, thus effectuating second- or third-degree price discrimination. 27

"Tying arrangements may be challenged under Section 1 of the Sherman Act, Section 3 of the Clayton Act, and Section 5 of the FTC Act, and they may constitute conduct supporting a monopolization claim under Section 2 of the Sherman Act." 28
Whatever the statute, it can be shown that price discrimination increases total economic welfare when output grows and consumers' surplus grows.

The seminal works of Robinson, Varian, and Schmalensee set forth the conditions sufficient for total economic welfare to increase. Building on Robinson's path-breaking work, 29

Schmalensee and Varian proved the sufficient conditions for a rise in total welfare in the context of price increases to a subset of consumers, where the firm with market power exercises third-degree price discrimination (i.e., where consumers are separated into groups depending on their differing elasticities of demand). 30
Increase in output is a necessary but not a sufficient condition, 31
contrary to Bork's assertion that output increase alone is sufficient. 32
(Output increase alone is sufficient for first and second-degree price discrimination to be proved as total welfare enhancing. 33
)

The additional sufficient condition for total welfare to grow under third-degree price discrimination, in addition to an increase in output, does not require complicated calculations. It requires only estimates of marginal cost and elasticities of demand. These measurements are commonplace in antitrust courtrooms today, however daunting they might have appeared when Robinson first suggested the concept of measuring the curvature of demand curves. 34

The reason why increased output alone is not a sufficient condition for total economic welfare to improve from third-degree price discrimination stems from the fact that the delta between price and marginal cost differs between the two (or more) groups of consumers. Economic welfare can be increased, therefore, by shifting sales between the groups until the delta between the economic value of one more unit for one group (as given by the price on the demand curve) and its marginal cost (which is unrelated to what consumers are willing to pay) has become equal to that delta for every other group. That is to say, the contribution to total economic welfare is the same at the margin of each group.

In third-degree price discrimination, one group of consumers (called "strong" consumers) pays a higher price than what would have been charged if the monopolist did not price-discriminate, and another group of consumers (called "weak" consumers) pays a lower price. The group of strong consumers has its consumers' surplus diminished by the higher price, and there is no guarantee that the increase in consumers' surplus enjoyed by the group of weak consumers, who pay a lower price, will offset that. If the sum is negative, it might be sufficiently negative to offset the growth in total economic welfare from the increase in output. Robinson concluded, "Before it is possible to say whether discrimination is desirable or not, it is therefore necessary to weigh up the benefit from the increase in output against this disadvantage." 35

Schmalensee and Varian tests for efficiency of third-degree price discrimination

Varian proved that a strong sufficient condition for total economic welfare to increase is for the growth in consumers' surplus in the weak market to exceed the loss in consumers' surplus in the strong market. He estimated this difference as the weighted sum of the changes in output between the strong and the weak markets, where the weights are the marginal cost of production divided by (the absolute value of demand elasticity minus one). 36

Schmalensee had previously studied the case of constant marginal costs, and he similarly developed the equation that the total economic welfare change was the sum of the gain in consumers' surplus in the weak market and the loss of consumers' surplus in the strong market, as the supplier diverged from a uniform price. 37

Both tests required a measure of total consumers' surplus to grow, in order to find a strong sufficient condition for total welfare to grow. If courts apply the strong sufficient condition of either test, then consumer welfare and total welfare will both grow, and a court does not need to choose between them.

Aggregate Consumer Surplus

Of course, as is common in all calculations of consumers' surplus, measures of consumers' surplus are assumed to be additive: namely, that one consumer's welfare is entitled to be considered no more or less important than any other consumer's welfare. Varian noted the difference between individual and aggregate interests: "For this class of preferences it is well known that not only does consumers' surplus serve as a legitimate measure of individual welfare, but also that the individual consumers' utility functions can be added up to form a social utility function, that aggregate *consumers'* surplus is also meaningful." 38

Courts might find it more comfortable to deal with measured effects on output and estimates of demand elasticities rather than estimates of consumers' surplus. As Varian showed, one can use the former to estimate the latter. Measuring output and estimating elasticity of demand are the business of expert accountant and economic witnesses in modern antitrust cases. This should impose no unusual burden on a court today.

Simplification: Does output increase? Nevertheless, two possible simplifications would make practical sense if measurements of elasticity are not available

First, if there is a large growth in output after the supplier institutes the price discrimination, then a court might grant an affirmative defense under the assumption that only a massive decline in consumers' surplus would be enough to offset the welfare-enhancing effects of greater output. Second, requiring a bit more detail (but still useful as a rule of thumb), a court could look at the components of the Varian and Schmalensee formulations and more readily conclude that total economic welfare was enhanced by the price discrimination the greater the growth of output in the weak

market and the smaller the drop in output in the strong market, as compared with the outputs if the monopolist charged the same price in each market.

Price discrimination is the most difficult case for applying the consumer welfare standard because prices can rise for some consumers, and yet total consumers' surplus and economic welfare might still increase. The Schmalensee and Varian tests, however, provide a workable solution for courts to apply.

Judging Business Practices

Having dealt with price discrimination, we can return to the more general case for judging business practices. Here, a simple and powerful test is whether a business practice leads to an increase in total output. (If there is no price discrimination, then an increase in output will always be accompanied by a drop in price, as compared with the situation before the growth in output.) If output increases as a result of a business practice, then consumers' surplus and overall economic welfare both improve from the business practice, and antitrust law should not condemn it.

In predatory pricing, short-term output might grow as consumers buy more of the monopolist's goods at lower prices. Nevertheless, the test advanced here would not exonerate predatory pricing when a long-run perspective is adopted, whatever one's view of the plausibility of predatory pricing. 39

The essence of a predatory pricing claim is that, in the long-run, prices will rise and output will decline. Increased output is a necessary condition of increasing total economic welfare, 40 so a long-run predatory pricing strategy would not fit that condition.

Conclusion

The consumer welfare standard is met in most cases where a business practice leads to an increase in total output. In the case of third-degree price discrimination, however, output might increase but consumer welfare diminish. Nevertheless, there are strong sufficient conditions developed by Schmalensee and Varian for identifying when overall consumer welfare increases even in this situation. Applying those sufficient conditions requires only estimates of demand elasticities of differing groups of consumers and the marginal cost of production. When those conditions are present, the consumer welfare standard is an accurate surrogate for total economic welfare. This degree of precision and ease of application illustrate the superiority of the consumer welfare standard over non-economic, neo-Brandeisian factors in analyzing business practices under the lens of antitrust law.

Appendix

In the last 50 years, the Supreme Court has embraced the consumer welfare standard in its antitrust jurisprudence. Supplementing prior research by Keyte 41

and Hovenkamp, 42

a fresh review of Court opinions confirms that no decision supports antitrust liability based on a reduction of consumers' surplus when output actually increased. For reference, the cases are as follows.

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3. Illinois Brick Co. v. Illinois, 431 U.S. 720, 754–55 (1977).

4. Continental TV, Inc. v. GTE Sylvania, Inc., 433 U.S. 36, 56 (1977).

5. Pfizer, Inc. v. Gov't of India, 434 U.S. 308, 314-15 (1978).

6. Reiter v. Sonotone Corp., 442 U.S. 330, 343 (1979).

7. Arizona v. Maricopa County Medical Soc'y, 457 U.S. 332, 367 (1982) (Powell, J., dissenting).

8. Jefferson Parish Hosp. Dist. Number 2 v. Hyde, 466 U.S. 2, 15 (1984).

9. NCAA v. Board of Regents of the Univ. of Oklahoma, 468 U.S. 85, 107 (1984).

10. Atlantic Richfield v. USA Petroleum, 495 U.S. 328, 360 (1990).

11. Eastman Kodak Co. v. Image Technical Services, Inc., 504 U.S. 451, 487 (1992) (Scalia, J., dissenting).

12. Brooke Group Ltd. v. Brown & Williamson Tobacco Corp., 509 U.S. 209, 244 n.2 (Stevens, J., dissenting) (1993).

13. Illinois Tool Works, Inc. v. Independent Ink, Inc., 547 U.S. 28, 36-37 (2006).

14. Weyerhauser Co. v. Ross-Simmons Hardwood Lumber Co., 549 U.S. 312, 324 (2007).

15. Leegin Creative Leather Products, Inc. v. PSKS, Inc., 551 U.S. 877, 889-90 (2007).

16. Kirtsaeng v. John Wiley & Sons, Inc., 568 U.S. 519, 539 (2013).

17. FTC v. Actavis, Inc., 570 U.S. 136, 161 (2013) (Roberts, C.J., dissenting).

18. Ohio v. American Express Co., 585 U.S. 529, 551 (2018).

19. NCAA v. Alston, 594 U.S. 69, 106 (2021).

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Endnotes

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In the Matter of: Concerted Action, Consumer Welfare Standard, & Enforcement and Exemptions	)	Public Comment

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THE FUTURE OF ANTITRUST IN CALIFORNIA: THE CONSUMER WELFARE STANDARD, CONCERTED ACTION, AND OTHER ISSUES

CONTENTS

INTRODUCTION

On January 26, 2024, the Consumer Welfare Committee of the California Law Revision Commission ("the Commission") Study of Antitrust Law issued a report ("A Report of the Consumer Welfare Committee: What Constitutes Antitrust Harm?") discussing the standard that should be applied to determine whether business conduct violates the antitrust laws.[1] Two months later, the Commission released a report discussing California's restraint of trade rules ("Concerted Action Report").[2] At the same time, the Enforcement and Immunities Working Group issued its own report ("Enforcement and Exemptions Report") analyzing both state and federal antitrust enforcement and outlining proposed legislative changes.[3] The reports come amidst an ongoing process commissioned by the California legislature in 2022 to review the state's antitrust laws.[4]

The Information Technology and Innovation Foundation (ITIF) appreciates the opportunity to comment on these three reports and, in particular, to ensure that California and the United States more broadly maintain their roles as the leading innovation hubs of the world. This comment follows ITIF's previous comments to the Commission on its Single Firm Conduct and Concentration reports as well as its comment on its Mergers and Acquisitions & Technology Platforms reports.[5] While ITIF applauds the Commission for its continued efforts to evaluate the adequacy of California's competition laws and consider possible changes, this comment highlights concerns with the Consumer Welfare, Concerted Action and Enforcement and Exemptions reports, and specifically regarding their findings and proposals from the standpoint of promoting innovation.

This comment proceeds in five parts. The first analyzes the findings of the Consumer Welfare Report, and particularly its suggestion to embrace a competitive process or trading partner welfare standard. The second

[1] A Report of the Consumer Welfare Committee: What Constitutes Antitrust Harm? (Jan. 26, 2024) [hereinafter Consumer Welfare Report].

[2] California Law Review Commission Study of Antitrust Law (Mar. 26, 2024) [hereinafter Concerted Action Report].

[3] K Foote et al., Enforcement and Immunities Working Group Report (Mar. 26, 2024) [hereinafter Enforcement and Exemptions Report].

[4] *See* California Law Review Commission, Antitrust Law – Study B-750, Antitrust Law -- B-750 (ca.gov).

[5] Joseph V. Coniglio and Trelysa Long, *Comments for the California Law Review Commission Study of Antitrust Law Regarding Single-Firm Conduct and Concentration*, ITIF (May 2024); Joseph V. Coniglio, *Mergers and Innovation: Keeping California the World's Digital Leader*, ITIF (June 2024).

part considers the Concerted Action Report and its four recommended changes to the Cartwright Act. The third part discusses the Enforcement and Exemptions Report with a focus on its summary of potential actions that the California legislature could take to implement antitrust reforms. Next, the comment provides the Commission with several recommendations to consider as it continues to reflect upon possible new legislation. A brief conclusion follows.

CONSUMER WELFARE STANDARD

The Consumer Welfare Report criticizes the consumer welfare standard on the grounds that is ambiguous, writing that "[n]either the Supreme Court nor lower courts have defined the label 'consumer welfare' or clarified what harm to the consumer welfare entails."[6] But this is not correct. As the Supreme Court has made clear, the antitrust laws condemn behavior that harms "competition and consumer welfare."[7] Specifically, "the protection of "*competition*, not *competitors*" is the *purpose* of the antitrust enterprise.[8] Consumer welfare is the *standard* that courts use to give effect to that goal and which takes the form of proscribing behavior that results in "reduced output, increased prices, or decreased quality in the relevant market."[9] Diminished innovation is also a cognizable consumer welfare harm.[10] And the various *rules* courts apply—e.g., the *per se* rule, the predatory pricing rule in *Brooke Group*—are the way they evaluate whether competition and consumer welfare have been harmed for particular categories of conduct.[11]

The report also states that it is "unaware of any judicial opinion in which a court concluded that efficiency is a legitimate justification for harm to consumers."[12] This is also misleading. For several forms of unilateral conduct, and in particular "predatory innovation," courts like the Ninth Circuit in *Allied Orthopedic v. Tyco* have applied what commentators called a "sham innovation test" pursuant to which courts inquire "whether the innovation makes at least some consumers better off."[13] That is, if the innovation has procompetitive benefits, some courts will treat it as lawful—regardless of whether there may be anticompetitive harms from the conduct that ultimately outweigh those benefits. Importantly, such a rule is not inconsistent with the broader economic approach to antitrust law, but rather accounts for the harms that can arise from the application of a rule of reason balancing test in cases where there are tradeoffs between static and dynamic welfare, both in the form of chilling innovation and increasing administrative costs.[14]

The Consumer Welfare Report continues by identifying two presumptions that "have eroded the capacity of the antitrust enterprise to protect competition."[15] The first is the idea that antitrust rules should prioritize

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[6] Consumer Welfare Report at 2.

[7] Leegin Creative Lether Products v. PSKS, Inc.., 127 S.Ct. 2705, 2724 (2007).

[8] Brown Shoe Co. v. United States, 370 U.S. 294, 338 (1962).

[9] Ohio v. Amer. Express Co., 138 S.Ct. 2274, 2284 (2018).

[10] *See, e.g.*, United States v. Microsoft Corp., 253 F.3d 34 (D.C. Cir. 2001).

[11] Brooke Group Ltd. v. Brown & Williamson Tobacco Corp., 509 U.S. 209 (1993).

[12] Consumer Welfare Report at 3.

[13] *See* Jonathan Jacobson, Scott Sher & Edward Holman, *Predatory Innovation: An Analysis of Allied Orthopedic v. Tyco in the Context of Section 2 Jurisprudence*, 23 LOY. CONSUMER L. REV. 1, 30 (2010).

[14] 592 F.3d at 1000 ("To weigh the benefits of an improved product design against the resulting injuries to competitors is not just unwise, it is unadministrable. There are no criteria that courts can use to calculate the 'right' amount of innovation, which would maximize social gains and minimize competitive injury. A seemingly minor technological improvement today can lead to much greater advances in the future. The balancing test proposed by plaintiffs would therefore require courts to weigh as-yet-unknown benefits against current competitive injuries. Our precedents and the precedents we have relied upon strongly counsel against such a test.").

[15] Consumer Welfare Report at 7.

minimizing false positives.[16] But the popular criticism of this presumption—that the self-correction assumptions upon which it relies are tantamount to a doctrine of faith in "market forces"—is misplaced.[17] The modern assumptions surrounding self-correction that support a focus on avoiding false positives are ultimately derived from the rational expectations model of neoclassical economics, which neoliberal law and economics theorists like Milton Friedman justify on the grounds of providing the best means of predicting economic behavior.[18] Put another way, regardless of whether self-correction assumptions are actually true—and no doubt in some cases they are not—the absence of such an assumption would create an antitrust regime that is unable to produce clear and workable rules: if rationality assumptions are abandoned, it becomes extremely difficult for courts to ascertain the effects on any anticompetitive behavior at all.[19]

The second presumption is similar in orientation and concerns modern antitrust's disposition to hold that "vertical arrangements and unilateral conduct are unlikely to harm competition."[20] Of course, at one level, this presumption is undoubtedly correct: vertical agreements and unilateral behavior of various types by numerous firms are ubiquitous across the economy, and only an extremely small subset, even in principle, gives rise to potential antitrust concerns: namely, conduct done in conjunction with market and monopoly power respectively. And, even in the case of vertical agreements buttressed by market power or unilateral conduct by a monopolist, typically antitrust is limited to a group of well-defined conduct forms that can harm competition, like exclusive dealing or predatory pricing. For this reason, and in contrast to horizontal collusion—which is much more likely to be harmful—there is no economic basis to treat vertical agreements or unilateral conduct generally as not unlikely to harm competition.

The Consumer Welfare Report concludes by advocating for a movement away from the consumer welfare standard and the related notion that "consumers should be favored in an antitrust analysis against the welfare interests of other market participants."[21] To its credit, the report identifies problems with the neo-Brandeisian model of politicized antitrust enforcement, and specifically notes that "it would result in arbitrary and unpredictable antitrust decisions that would often reduce competition or economic welfare."[22] As an alternative, the report puts forward a "competitive process" or "trading partner welfare" standard, whereby "conduct that maintains, increases, or enhances market power to the detriment of trading partners, whether customers or suppliers is unlawful, unless that conduct can be justified as reasonably necessary to provide welfare enhancing benefits for those trading partners."[23]

The problem with this approach is that condemning business conduct which, for example, harms suppliers, may ultimately actually come at the expense of not just consumers but society. For example, practices which create countervailing buyer power that falls short of monopsony may reduce producer surplus and harm suppliers, but ultimately enhance both consumer surplus through lower prices *and* total surplus by increasing

[16] *Id.* at 6–7.

[17] *See, e.g.,* Lina M. Khan, *The New Brandeis Movement: America's Antimonopoly Debate*, 9 J. EURO. COMP. L. & PRACTICE 131, 123 (2018).

[18] MILTON FRIEDMAN, *The Methodology of Positive Economics*, in ESSAYS IN POSITIVE ECONOMICS 3, 15 (1953).

[19] *See, e.g.*, Alan Devlin & Michael Jacobs, *The Empty Promise of Behavioral Antitrust*, 37. HARV. J. L. & PUB. POL'Y 1009, 1023 (2015) (writing that "the behavioral account of competition cannot generate coherent rules of decision").

[20] Consumer Welfare Report at 7.

[21] *Id.*

[22] *Id.* at 8.

[23] *Id.*

output.[24] As such, a standard that condemns business conduct that reduces economic surplus to *any* group (i.e., not just consumers, but suppliers or workers, etc.) is likely to result in false positives relative to, for example, the comprehensive total surplus standard favored by the Chicago School.[25] Moreover, adding worker harms to the mix will not only create similar tradeoffs—conduct that may improve worker welfare and increase wages could harm small businesses and producer surplus—but also seem to deviate from the standard partial equilibrium models upon which modern antitrust is based, and thus risk going beyond the scope of administrable economic analysis.[26]

CONCERTED ACTION

Unlike the Sherman Act, which is a broad antitrust statute that can apply to agreements, unilateral conduct, and mergers (albeit the latter typically challenged using the Clayton Act), California's Cartwright Act is focused on agreements in restraint of trade (excluding mergers[27]). To be sure, as the Concerted Action report notes, the Cartwright Act reflects an antitrust regime "independent" from federal law.[28] However, courts have not only treated Sherman Act jurisprudence as "applicable" to the Cartwright Act.[29] They have also made clear that the Cartwright Act "mirrors" the Sherman Act's prohibition of restraints of trade.[30] Nonetheless, the report suggests that legislation could clarify that the "Cartwright Act is broader than federal antitrust law and has its own common law"[31] and contemplates using the Cartwright Act to condemn behavior that does not violate federal law.

As ITIF has previously explained, as a general matter, such an expansion of the Cartwright Act may result in issues that ultimately undermine state antitrust enforcement. Specifically, taking this approach could:

> …create tensions within the broader U.S. antitrust enforcement landscape. And, although it is true that Supreme Court in *California v. ARC Am. Corp.* held that state antitrust laws can prohibit behavior that is not unlawful under federal standards, this is not a blanket constitutional protection. That is, state antitrust laws could be pre-empted by Congress, and indeed courts have in some cases pre-empted state antitrust laws if they are incompatible with federal standards. Indeed, as distinct from the courts, Congressional pre-emption could also be used to address problems associated with state enforcement actions that go beyond accepted federal standards and create a fragmented antitrust enforcement landscape.[32]

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[24] *See* Peter Carstensen, *Buyer Power, Competition Policy, and Antitrust: The Competitive Effects of Discrimination Among Suppliers*, 53 ANTITRUST BULL. 271, 330–31 (2008).

[25] ROBERT BORK, THE ANTITRUST PARADOX (1978).

[26] *Cf.* Mark Glick, *The Unsound Theory Behind the Consumer (and Total) Welfare Goal in Antitrust*, 63 ANTITRUST BULL. 455, 471 (2018) (concluding that "the significant work and advancement in the modeling of general equilibrium and Pareto optimality has led to a dead end as far as relevance for antitrust analysis" and that the Pareto criteria are "basically unworkable for antitrust purposes because it cannot distinguish between an unlimited number of Pareto optimal points and it cannot make judgments between situations that involve a loss to any individual").

[27] State of California ex rel. Van de Kamp v. Texaco, Inc., 46 Cal. 3d 1147 (1988).

[28] Concerted Action Report at 5.

[29] *Id.* (citing Flagship Theatres of Palm Desert, LLC v. Century Theatres, Inc., 55 Cal. App. 5th 381, 400, 269 Cal. Rptr. 3d 446, 461 (2020)).

[30] *See, e.g.*, PLS.Com, LLC v. Nat'l Ass'n of Realtors, 32 F.4th 824, 831–32 (9th Cir. 2022).

[31] Concerted Action Report at 8.

[32] Joseph V. Coniglio and Trelysa Long, *Comments for the California Law Review Commission Study of Antitrust Law Regarding Single-Firm Conduct and Concentration*, ITIF at 9 (May 2024).

The Concerted Action report identifies four specific areas for changes. First, the report considers eliminating the distinction between commodities and services for purposes of tying offenses under §16727 under the Cartwright Act, which at present only applies to commodities, claiming that "[f]rom an economic and market perspective there is no rational basis for distinguishing between commodities and other goods and services in the market."[33] ITIF agrees with this recommendation. Moreover, and importantly, such a change would not expand the Cartwright Act beyond federal law, but rather harmonize California's antitrust regime with existing national standards, as while tying claims under §3 of the Clayton Act are limited to sales or leases of goods or commodities, §1 of the Sherman Act allows for tying claims involving services.

The second reform proposal put forward by the report involves revising or deleting §16720(b)–(e), with the view that those sections "do not add significantly to the general condemnation in §16720(a)" of concerted restraints.[34] However, the report recommends retaining both §16720(e)(3), which specifically condemns resale price maintenance (RPM), and (c), which involves an "explicit condemnation of restraints affecting the buying side of the market (§16720(c))."[35] ITIF takes no issue with the first recommendation to eliminate §16720(b)–(e), which is in line with the Sherman Act's "common law statute" model, as distinct from a more rule focused approach.[36] However, excepting §16720(e)(3) on the grounds that RPM should be flagged for stricter scrutiny may result in problematic and unnecessary divergence from federal standards.[37] And, with respect to §16720(c), as noted *supra*, specific protections against buyer power not only risk straying from the federal consumer welfare standard, but put courts in the position of having to condemn conduct that may, for example, harm suppliers but increase both consumer and total surplus.

Third, the Concerted Action report suggests a reframing of the Cartwright Act's analytical structure whereby the "statutes impose a general condemnation of all restraints in §16720, §16722, and §16726, but §16725 provides an affirmative defense if the party defending a restraint demonstrates that it functions "…to promote, encourage or increase competition in any trade or industry, or …[is] in furtherance of trade."[38] ITIF has concerns with this proposal. Excepting cartel agreements, which will be *per se* unlawful, the report seems to suggest that the burden of proof or at least the initial burden of production may be with defendants having to show that their conduct is procompetitive, rather than with the plaintiff to show that the conduct will result in anticompetitive effects or harm. However, as highlighted *supra*, the vast majority of agreements to which the Cartwright Act is applicable do not raise anticompetitive concerns—either due to a lack of market power, the nature of the conduct, or the existence of procompetitive benefits—making such a shift in the evidentiary burden unjustifiable to the extent contemplated by the report.

Finally, the Concerted Action report highlights RPM as a practice that "should be categorically condemned."[39] Specifically, the report suggests that the "condemnation in §16720(b)(3) could be revised either explicitly to condemn RPM as illegal or to exclude it from inclusion in those restraints that are reviewable under §16725."[40] In support of this approach, which is tantamount to treating RPM as *per se* unlawful, the report states without citation that "there is in fact little empirical support for the claim that

[33] Concerted Action Report at 62.

[34] *Id.* at 63.

[35] *Id.*

[36] Leegin Creative Leather Products, Inc. v. PSKS, Inc., 551 U.S. 877 (2007).

[37] *Id.*

[38] Concerted Action Report at 65.

[39] *Id.* at 66.

[40] *Id.*

RPM results in economically desirable outcomes."[41] However, there continue to be studies showing how RPM can result in welfare enhancing outcomes.[42] This supports the rule of reason approach taken by the Supreme Court in *Leegin*.[43] As such, *per se* condemnation for RPM remains inadvisable as an economic matter.

ENFORCEMENT AND EXEMPTIONS

The Enforcement and Exemptions report includes several potential actions for the California legislature to consider for purposes of modifying its antitrust regime. First, the report calls "to amend Cartwright to be applicable to single firm conduct."[44] As concerns this recommendation, as ITIF has previously explained, "[c]reating additional state antitrust liability should be a response to some failure of federal antitrust enforcement to adequately ensure competition and innovation in California," which does not appear to be the case.[45] Moreover, "even if amending the Cartwright Act to encompass unilateral conduct were a response to some limitations with respect to the existing legal framework," while adding a unilateral conduct regime for California is not necessarily problematic in principle, to the extent such a regime is justified on the grounds of going beyond the Sherman Act, it risks creating both substantive and practical issues that make it a suboptimal policy choice.[46]

A second potential action item asks "for the courts to utilize a 'structured rule of reason' standard or burden-shifting process where warranted in Cartwright cases."[47] According to the report, this "structured rule of reason" was applied by the California Supreme Court as a rule distinct from the traditional *per se*, rule of reason, and even quick look approaches.[48] Rather, in the words of the U.S. Supreme Court, this test reflects "an enquiry meet for the case" akin to "something of a sliding scale" whereby antitrust rules are commensurate with the severity of the conduct at issue.[49] Here the report may be based on a misunderstanding. That is, this "structured rule of reason" is not itself a rule that applies to determine whether a particular *instance* of conduct is unlawful (e.g., tying by firm X in market Y), but instead the means of determining which antitrust rule should apply to a conduct *category* (e.g., tying), or what commentators have called a "meta-rule of reason" in the context of Sherman Act §2 and which is rooted in a broader decision theoretic framework.[50] In other words, under this structured rule of reason, conduct that is extremely likely to harm competition, like horizontal collusion, is to be evaluated using a *per se* rule; by contrast, for conduct that is generally competitively neutral or procompetitive, like vertical non-price restraints, a rule of reason applies.

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[41] *Id.*

[42] *See, e.g.*, Rhys J. Williams, *Empirical Effects of Resale Price Maintenance: Evidence From Fixed Book Price Policies in Europe*, 20 J. COMP. L. & ECON. 108 (2024); Kohei Kawaguchi, Jeff Qiu & Yi Zhang, *Competitive Effects of Resale Price Maintenance Through Inventory: Evidence from Publishing Industry*, Economic Analysis Group Discussion Paper (2022).

[43] Leegin Creative Leather Products, Inc. v. PSKS, Inc., 127 S.Ct. 2705, 2715 (2007) ("Though each side of the debate can find sources to support its position, it suffices to say here that economics literature is replete with procompetitive justifications for a manufacturer's use of resale price maintenance.").

[44] Enforcement and Exemptions Report at 21.

[45] Joseph V. Coniglio and Trelysa Long, *Comments for the California Law Review Commission Study of Antitrust Law Regarding Single-Firm Conduct and Concentration*, ITIF at 7–8 (May 2024).

[46] *Id.* at 7–9.

[47] Enforcement and Exemptions Report at 21.

[48] *See* In re Cipro Cases I & II, 61 Cal. 4th 116 (2015).

[49] Cal. Dental Ass'n v. Fed. Trade Comm'n, 526 U.S. 756, 780–81 (1999); *see also* Fed. Trade Comm'n v. Actavis, Inc., 133 S.Ct. 2223 (2013).

[50] Mark S. Popofsky, *Defining Exclusionary Conduct: Section 2, The Rule of Reason, and the Unifying Principle Underlying Antitrust Rules* 73 ANTITRUST L.J. 435, 456 (2006).

Next, the Enforcement and Exemptions report invites the legislature to "[c]larify that antitrust standing requirement under Cartwright is based on general proximate cause rules, i.e. target area test."[51] Specifically, the report finds that California courts continued reliance on the factors in the Supreme Court's decision in *Assoc. Gen. Contractors of Cal. v. Cal. State Council of Carpenters* that determine standing under the Sherman Act is based on "the erroneous view that California's antitrust statute and related standing doctrine are coextensive with the Sherman Act."[52] And, as the report intimates, the "target area test" is typically viewed as a lower bar to standing than the *AGC* test.[53] However, as noted *supra*, not only must California be wary of deviations from federal standards that may ultimately have unintended effects like undercutting California's antitrust regime, but it must also avoid major changes which substantially increase antitrust liability and open the door to "a deluge of litigation" that places substantial burdens on California's judicial system.[54]

A fourth potential action is given as clarifying "that resale price maintenance remains per se unlawful under the Cartwright Act notwithstanding the US Supreme Court's ruling in the *Leegin* case."[55] However, and as discussed *supra*, not only do empirical studies continue to demonstrate the procompetitive benefits of RPM, but treating RPM as *per se* unlawful would create a substantial gulf between California law and federal law, and thus contribute to fragmentation in the broader U.S. antitrust landscape. Indeed, condemning RPM as *per se* unlawful is also out of step with state antitrust practices, with Maryland being the only state that currently has a *per se* rule against minimum RPM (in New York, minimum RPM is not treated as *per se* unlawful, but unenforceable).[56] As such, following through with a *per se* approach risks making California an outlier among both state and federal antitrust norms regarding the treatment of RPM.

The Enforcement and Exemptions report further recommends consideration of whether the Cartwright Act should be amended to apply to mergers and acquisitions.[57] However, as the report itself notes, states already have the right to challenge mergers under the Clayton Act, which suggests that additional authority under the Cartwright Act would be, at least in theory, superfluous.[58] In fact, the Commission elsewhere acknowledged that "California cannot, as a practical matter, enact a merger statute that is more lenient than the federal standard."[59] And, as ITIF previously explained, "it is not at all clear how a stricter standard would be worthwhile."[60] Indeed, rather than be responsive to some failure of federal law to police anticompetitive acquisitions in California, there is already an extreme amount of scrutiny by the DOJ and FTC of, for example, acquisitions by large California technology companies thought to have a risk of harming potential competition.[61] And, of course, in court many of these theories of harm don't even pass muster.[62]

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[51] Enforcement and Exemptions Report at 21.

[52] *Id.* at 10.

[53] *Id.* at 9.

[54] Joseph V. Coniglio and Trelysa Long, *Comments for the California Law Review Commission Study of Antitrust Law Regarding Single-Firm Conduct and Concentration*, ITIF at 8 (May 2024).

[55] Enforcement and Exemptions at 21.

[56] See New York v. Tempur-Pedic International, Inc., 30 Misc. 3d 986 (N.Y. Sup. Ct. 2011), *aff'd*, 944 N.Y.S.2d 518 (1st Dep't 2012).

[57] Enforcement and Exemptions Report at 22.

[58] *Id.* at 2.

[59] R. Gilbert at al., California Antitrust Law and Mergers at 18 (Mar. 26, 2024).

[60] Joseph V. Coniglio, *Mergers and Innovation: Keeping California the World's Digital Leader*, ITIF at 7 (June 2024).

[61] *See, e.g.*, Jonathan Kanter, Ass't Att'y Gen., U.S. Dep't of Justice, Antitrust Div., *Antitrust AAG Kanter Statement After Adobe and Figma Abandon Merger* (Dec. 18, 2023).

[62] Fed. Trade Comm'n v. Meta Platforms, Inc., No. 5:22-cv-04325-EJD, 2022 WL 16637996 (N.D. Cal. Nov. 2, 2022).

Relatedly, the Exemptions and Enforcement report countenances adoption of a "[p]re-Merger notification law only in conjunction with additional measures relating to payment of fees, expanded staffing of the Antitrust law Section, [and] penalties for violations."[63] Of course, the reason for this financial caveat is explainable by virtue of, as identified in the report, the substantial costs associated with running a merger control regime. Indeed, these costs are likely prohibitive for California to the extent it wishes to have a merger control regime that materially improves the status quo. To give one data point, whereas the federal antitrust agencies reviewed over 3,000 transactions in 2022, the report admits that the California Attorney General reviews "no more than half a dozen of them."[64] This is a huge gap that is consistent with the view that no reasonably practicable increase in funding is likely to add meaningful benefits on top of the existing and extensive federal merger control regime.[65]

RECOMMENDATIONS

For these reasons, ITIF has concerns with several of the proposals identified in the reports and offers the following recommendations:

- **Maintain the consumer welfare standard:** The Commission rightly strays away from the politicized neo-Brandeisian antitrust model which protects competitors rather than competition. However, its "competitive process" and "trading partner welfare" alternatives to the consumer welfare standard raise a number of acute problems both substantively and with respect to creating considerable fragmentation between California and federal antitrust law, which has long been guided by the view that the antitrust laws are a "consumer welfare proscription."
- **Keep the Cartwright Act's concerted action rules consistent with federal law:** While ITIF commends certain proposals, like extending tying liability to include services and making the language of the Cartwright consistent with the Sherman Act model of a "common law statute," preserving more specific rules to place greater scrutiny on RPM and buyer power is out of step with sound economic and legal principles. Moreover, for all restraints of trade, both the burden of proof and the initial burden of production should always rest with the plaintiff to produce evidence that the conduct in question is anticompetitive.
- **Radical reforms are unnecessary**: There is no need to radically expand California's antitrust regime by, for example, expanding it to encompass unilateral conduct or mergers, as well as through the creation of a costly and administratively burdensome merger control regime. Additionally, the use of a "structured rule of reason" is already a feature of modern antitrust jurisprudence, not as an alternative to the *per se*, quick look, or rule of reason tests for evaluating particular behavior, but as a mechanism for determining which of such (and other) rules will be used for general conduct categories.

CONCLUSION

ITIF appreciates the opportunity to submit comments to the Commission in connection with its ongoing review of California's antitrust regime. At bottom, changes to California's antitrust law should be grounded in empirically demonstrable failures by the *status quo* to protect competition and consumers. And yet, in reality, the past forty years have been a world-renowned success story for California's economy fueled by innovation and technological revolutions that continue to drive its dynamic businesses and benefit consumers. This

[63] Enforcement and Exemptions Report at 21.

[64] *Id.* at 13.

[65] FED. TRADE COMM'N & DEP'T OF JUSTICE, HART-SCOTT-RODINO ANNUAL REPORT FISCAL YEAR 2022 (2023).

system has been enabled not just by the creativity and entrepreneurial values that are key to California's culture, but also by a sound system of antitrust policy focused on protecting competition and consumers.

Thank you for your consideration.

Joseph Van Coniglio (CA Bar No. 315045)
Director, Schumpeter Project on Competition Policy
Information Technology and Innovation Foundation

Memorandum In Support of the Twenty-First Century Antitrust Act
(S6748B/A10323)

June 2024

American Economic Liberties Project Supports the Twenty-First Century Antitrust Act

Dear Members of the New York State Legislature,

The American Economic Liberties Project is an organization dedicated to reducing the power that corporations wield over our economy and our democracy, in pursuit of economic liberty for all. We write to express our strong support for the Twenty-First Century Antitrust Act authored by Senate Deputy Majority Leader Gianaris and Assembly Majority Leader Peoples-Stokes. The passage of this bill would place New York at the forefront of the national effort to challenge the power dominant corporations hold over workers, small businesses, and everyday families by providing vital new authority to New York's antitrust enforcers.

Over the last two decades, 75 percent of U.S. industries have experienced an increase in concentration.[1] This is clear in industries such as tech, retail, and agriculture, but it's happening everywhere, in industries as varied as prison phone services, eyeglasses, and road salt. Increased corporate concentration contributes to a range of economic and social ills: raising prices, lowering wages, eroding job quality and quantity, quashing innovation and entrepreneurship, and ultimately driving local businesses out of their communities.[2]

Since the Reagan years, courts have abandoned the traditional understanding of antitrust law and accepted that its goal is to promote "efficiency," which will ultimately result in lower prices for consumers. But the "consumer welfare standard," as this view is known, doesn't take into account the ability of dominant corporations to use anti-competitive tactics to cause a range of harms, most specifically to workers and local businesses. Applying this failed standard has caused a dramatic erosion of antimonopoly enforcement; dominant corporations can use anti-competitive tactics and mergers to cause widespread layoffs and degraded working conditions across an industry without running afoul of state or federal antitrust law.

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[1] Gustavo Grullon, Yelena Larkin, and Roni Michaely, "Are U.S. Industries Becoming More Concentrated?" Swiss Finance Institute Research Paper No. 19-41. https://ssrn.com/abstract=2612047

[2] "Confronting America's Concentration Crisis: A Ledger of Harms and Framework for Advancing Economic Liberty for All," American Economic Liberties Project, July 2020 https://www.economicliberties.us/wp-content/uploads/2020/08/Ledger-of-Harms-R41.pdf

Case law for New York's antitrust law, the Donnelly Act, closely follows federal interpretations of antitrust law, making it difficult for enforcers, workers, or small and mid-sized businesses to hold dominant corporations accountable for predatory and unfair tactics. The Donnelly Act also does not allow enforcers to hold single firms accountable for anti-competitive conduct, and is instead limited to policing actions committed by two or more firms.

The Twenty-First Century Antitrust Act addresses these and other critical shortcomings of antitrust law by:

- Modernizing New York law to address anti-competitive acts by a single firm;
- Creating an "abuse of dominance standard," which lowers the high threshold under current law for showing a firm has monopoly power and, once dominance is demonstrated, subjects dominant corporations to greater scrutiny, ensuring they don't abuse their power to stifle competition;
- Allowing antitrust enforcers to directly address the impact of labor market dominance on workers by barring dominant employers from using their outsized influence to lower wages or degrade working conditions across an industry;
- Requiring corporations to notify the Attorney General in advance of potentially harmful mergers, and allowing the AG to scrutinize mergers for a range of potential impacts, including on labor markets;
- Empowering New Yorkers to join class action suits to enforce their rights, and;
- Enhancing criminal penalties for antitrust violations.

Critically, this bill protects workers in New York by creating new labor protections that address the evolving challenges faced by workers in modern labor markets that are dominated by large firms. Monopsony power, where a single buyer has substantial control over the labor market, can lead to lower wages, reduced job opportunities, and diminished bargaining power for workers. By prohibiting abusive practices that harm competition in labor markets, this legislation helps safeguard workers from exploitation and ensures that they can negotiate fair wages and working conditions. Additionally, the Act's provisions for private enforcement through class action lawsuits empower workers to seek redress and remedies for violations.

Overall, these measures are crucial for protecting workers' rights, promoting economic fairness, and fostering a more equitable society in New York.

As national momentum gathers around the cause of reforming and updating antitrust law, New York has an opportunity and obligation to set a new standard for the nation. Passing this transformative legislation

would be a major step forward in the fight for a fair economy for all New Yorkers, and we applaud the leadership of the sponsors. We urge you to pass this legislation without delay.

Sincerely,

The American Economic Liberties Project

Presentation before the California Law Revision Commission

Antitrust Study B-750

August 15, 2024

Lee Hepner, Senior Legal Counsel

EX 191

Bringing antitrust theory into practice

1. US v. Google – the "Google Search" case
   - Harm to trading partners
   - Weighing cross-market effects?

2. "AI Price-Fixing" – In re RealPage Antitrust Litigation and related enforcement/investigation
   - The new frontier of price fixing/concerted action
   - Are existing laws against concerted action strong enough?

US v. Google (the "Google Search" case)

- The "Mount Rushmore" of antitrust cases (*Standard Oil*, *AT&T*, *Microsoft*, and now *Google Search*)

- Public enforcement of Section 2 of the Sherman Act (single-firm conduct, illegal monopolization) are *rare* – but why?

US v. Google – by the numbers...

- 2009: 80% of all search queries go through Google
- 2020: nearly 90% go through
  - Even higher on mobile devices: 95%
- 2021: Google generated $146 billion in ad revenue
- 2021: Google pays more than $26 billion to secure preloaded defaults

US v. Google – theory of the case

- "Even if the origin of the monopoly power was innocent … maintaining or **extending market control** by the exercise of that power is sufficient to complete a violation of Section 2." – *Eastman Kodak Co.*, 603 F.2d 263, 274 (2d Cir. 1979) (emphasis added)

- "Like Microsoft before it, Google has thwarted true competition by foreclosing its rivals from the most effective channels of search distribution." Opinion, p. 202.

US v. Google – theory of the case

- Consumer welfare standard? Not at the forefront of this case, see discussion of output and innovation:

Also, reduced output is an ill-fitting indicia of monopoly power in a market like search. Google's marginal cost of responding to one additional query is near zero. In such a market, a dominant firm has no incentive to restrict output to earn monopoly profits. *See* H. ØVERBY & JAN ARLID AUDESTAD, INTRODUCTION TO DIGITAL ECONOMICS § 6.2 (2d ed. 2021) (For a digital good like search, "because the marginal cost is zero and [] there is no limit to the number of units that

competition. In truth, Google's penchant for innovation is consistent with the behavior of a monopolist. *Microsoft*, 253 F.3d at 57 ("[M]onopolists have reason to invest in R&D," as "innovation can increase an already dominant market share and further delay the emergence of competition[.]").

EX 196

US v. Google – theory of the case

- "*Welfare of trading partners*" is central to this case.

The agreements have three primary anticompetitive effects: (1) market foreclosure, (2) preventing rivals from achieving scale, and (3) diminishing the incentives of rivals to invest and innovate in general search. Plaintiffs also contend that Google's incentives to invest are diminished, but the evidence of that effect is weaker than the others.

Alternatives to “consumer welfare standard”

“The consumer welfare standard’s days are numbered.”
– Steve Salop, PROMARKET, 2023

The *Google Search* case rejects – *at least in part* – that harm to competition means impact to consumers in terms of negative effects on price, output, quality, and innovation.

Alternatives to "consumer welfare standard"

"The consumer welfare standard's days are numbered."
– Steve Salop, PROMARKET, 2023

So what takes it place? A reversion to first principles of antitrust.

- "**Reasonable Competitive Conduct**" standard (Salop)
- "**Competitive Process**" or "**Trading Partner Welfare**" standard (Working Group Report)
- "**Abuse of Dominance**" standard (NY 21st Century Antitrust Act; Minnesota HF 1563; Pennsylvania "Open Markets" Act; CLRC authorizing resolution ACR 95)

Alternatives to “consumer welfare standard”

More importantly –Á*what conduct* is being prohibited, or is deserving of heightened skepticism?

- Vertical coercion –Á restraints on upstream trading partners (including labor), price discrimination
- Substantial foreclosure (incl. exclusive dealing) of rivals –Á *Google Search* antitrust litigation; *US v. Live Nation*
- High prices *alone* are not the epitome of anticompetitive harm.

Limiting weight of cross-market "benefits"

3. Cross-Market Benefits

Google also claims that its distribution agreements create procompetitive benefits within the related markets themselves, which independently justifies their exclusionary effect in the market for search. *See* GCL ¶ 116 ("Procompetitive benefits that accrue in highly complementary markets should be considered in addition to the aforementioned benefits in Plaintiffs' alleged markets."). Put differently, Google says that exclusionary conduct in one market can be excused if it sufficiently promotes competition in another. This is a concept known as cross-market balancing. The parties dispute whether the court can engage in such balancing in a Section 2 case.

The Ninth Circuit recently observed that "[t]he Supreme Court's precedent on cross-market balancing is not clear." *Epic Games*, 67 F.4th at 989; *see NCAA v. Alston*, 594 U.S. 69, 87 (2021)

Broad Areas of Consensus at the CLRC

1. California lacks a "single-firm conduct" law that mirrors Section 2 of the Sherman Act.

   Recommendation: California Lawmakers should amend the Cartwright Act to adopt a single-firm conduct standard.

2. "Most antitrust scholars believe that antitrust enforcement should be strengthened without abandoning the focus on economic welfare." (Working Group Report)

Broad Areas of Consensus at the CLRC

2. "Most antitrust scholars believe that **antitrust enforcement should be strengthened** without abandoning the focus on economic welfare." (Working Group Report)

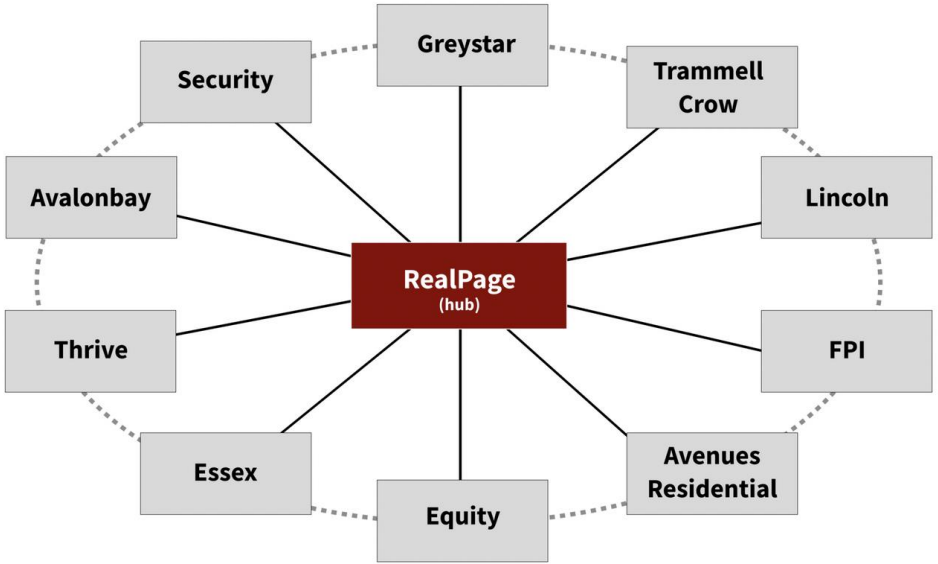
Recommendation 1: A single-firm conduct law should explicitly name an alternative standard ("abuse of dominance," "welfare of trading partners," etc.)

Recommendation 2: The law should expressly prohibit per se illegal conduct that fall under the new standard, including behavior that courts have *already deemed illegal*.

Recommendation 3: Limit balancing of out-of-market benefits.

A Brief Note About RealPage and "AI Price Fixing"

Hub-and-Spoke Price-Fixing:



A Brief Note About Realpage and "AI Rent-Fixing"

"[W]eÁareÁallÁtechnicallyÁcompetitorsÁÁÁÁ[butÁRealPage]Áhelps ÁusÁtoÁworkÁtogetherÁÁÁÁ to make us all more successful in our pricing . . . [RealPage] is designed to work with a community in pricing strategies, not work separately . . . we rarely make any overridesÁtoÁtheÁpricing]ÁrecommendationsÁÁÁ"Á

With this software, owners used live dynamic pricing that updates regularly, based on a model trained on a large dataset of over ***16 million units***. The software is also improving as new property managers are added to their list of clients, and is currently responsible for the pricing of ***8% of all rentals units*** nationwide.

Non-public, competitively-sensitive data:

- **The sharing of nonpublic, sensitive pricing and supply data is against a competitor's economic self-interest, *unless they know they are receiving in return the benefits of their competitors' data***

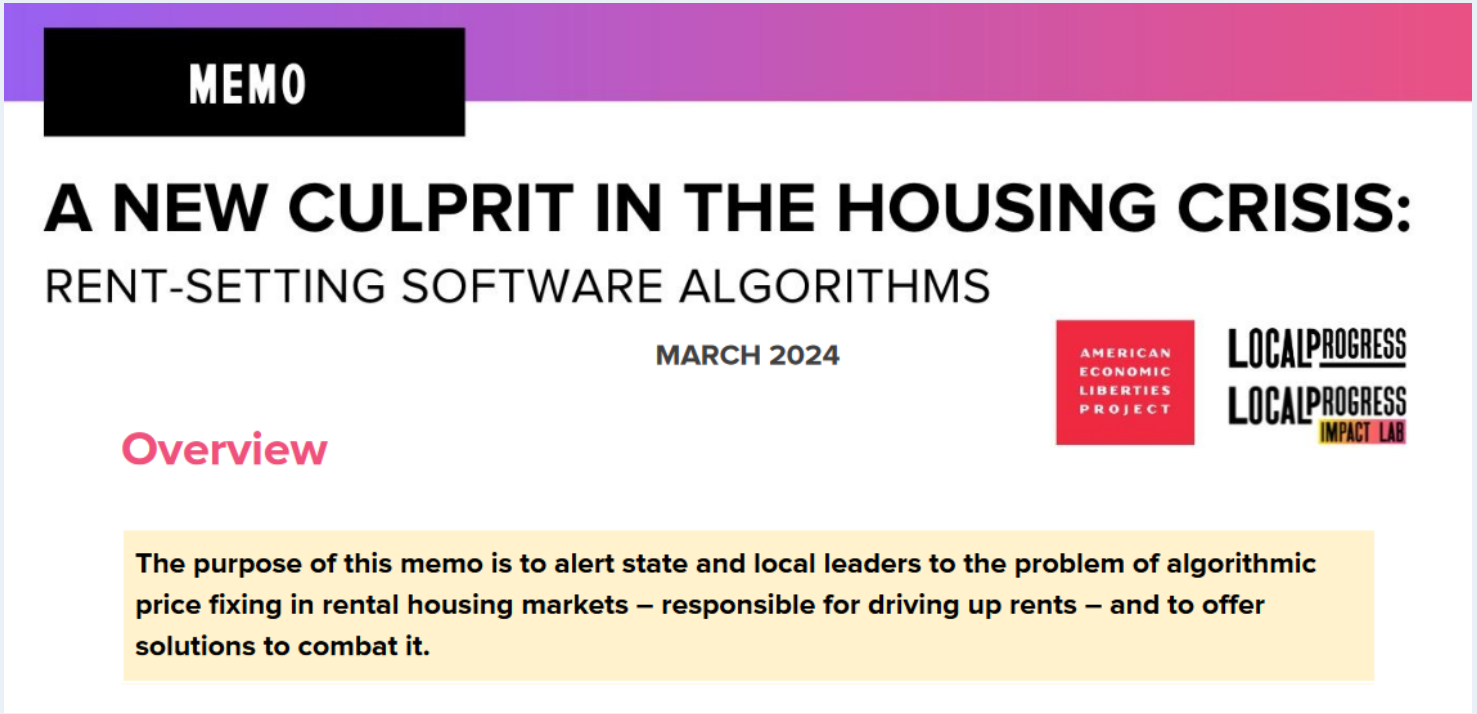
its competitors. (See, e.g., Doc. No. 530 ¶¶ 31, 287, 289). In doing so, RealPage would make true its vow to its RMS clients to "outperform the market," primarily by increasing rent prices. It would clearly not be in any individual Defendant's economic self-interest to contribute its data to RealPage without knowing that it would benefit from its horizontal competitors doing the same. Put another way, the contribution of sensitive pricing and supply data for use by RealPage to recommend prices for competitor units is in Defendants' economic self-interest if and only if Defendants know they are receiving in return the benefit of their competitors' data in pricing their own units. While Defendants

Source: ***In re RealPage, Inc., Rental Software Antitrust Litig. (No. II)*****, No. 3:23-MD-03071, 2023 WL 9004806, at *15 (M.D. Tenn. Dec. 28, 2023)**

ButÁt'sÁnotÁjustÁnon-public information. Third-party software can facilitate price fixing with public information, too.

The Question: WhatÁconstitutesÁanÁ"agreement"?Á It'sÁthe <u>use</u> of software that has this effect.

Model Legislation to Prevent “AI Price-Fixing”:



MEMO

A NEW CULPRIT IN THE HOUSING CRISIS:

RENT-SETTING SOFTWARE ALGORITHMS

MARCH 2024

AMERICAN ECONOMIC LIBERTIES PROJECT

LOCALPROGRESS

LOCALPROGRESS IMPACT LAB

Overview

The purpose of this memo is to alert state and local leaders to the problem of algorithmic price fixing in rental housing markets – responsible for driving up rents – and to offer solutions to combat it.

EX 208

Enforcement Actions:

Arizona Attorney General
Kris Mayes

Attorney General Mayes Sues RealPage and Residential Landlords for Illegal Price-Fixing Conspiracy

Wednesday, February 28, 2024

PHOENIX – Attorney General Kris Mayes today announced a lawsuit against RealPage, Inc. and nine major residential apartment landlords operating in Arizona for conspiring to illegally raise rents for hundreds of thousands of Arizona renters in the Phoenix and Tucson metro areas. RealPage is a software company that offers what it calls "revenue management" to its clients, including those named as its co-defendants in this lawsuit.

Office of the Attorney General for the District of Columbia

MENU

Newsroom

Attorney General Schwalb Sues RealPage & Residential Landlords for Rental Price-Fixing, Illegally Raising Thousands of District Residents' Rents

November 1, 2023

Lawsuit Alleges that 14 of DC's Largest Landlords Coordinated Through RealPage's Centralized Price-Setting Algorithm to Artificially Inflate Rent Prices

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METRO ATLANTA

FBI raid thrusts antitrust claims against Atlanta landlords into spotlight

A Texas-based tech company is accused of colluding with management companies and landlords to artificially inflate the price of rents.

Reuters

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RealPage antitrust lawsuits over rent prices consolidated in Tennessee

By Mike Scarcella

April 10, 2023 1:55 PM PDT · Updated a year ago

EX 209

AMERICAN ECONOMIC LIBERTIES PROJECT

Federal Legislative Efforts:

Wyden and Welch Introduce Legislation to Crack down on Companies that Inflate Rents with Price-Fixing Algorithms

Senators Klobuchar, Sanders, Hirono, Butler, Merkley and Blumenthal Cosponsor the Preventing the Algorithmic Facilitation of Rental Housing Cartels Act to Speed Up Enforcement Against Companies That Allow Landlords to Collude on Rent Increases

Klobuchar, Colleagues Introduce Antitrust Legislation to Prevent Algorithmic Price Fixing

February 2, 2024

WASHINGTON - U.S. Senator Amy Klobuchar (D-MN), Chairwoman of the Senate Judiciary Subcommittee on Competition Policy, Antitrust, and Consumer Rights, along with Senators Ron Wyden (D-OR), Dick Durbin (D-IL), Peter Welch (D-VT), Mazie Hirono (D-HI), and Richard Blumenthal (D-CT), introduced the *Preventing Algorithmic Collusion Act* to prevent companies from using algorithms to collude to set higher prices.

Reps. Becca Balint and Jesús "Chuy" García Introduce Legislation to Crack Down on Companies Exacerbating Rental Housing Crisis Through Price-Fixing Algorithms

Washington, June 6, 2024

State and Local Lawmakers Can Act!

BAY AREA

San Francisco becomes first US city to ban automated rent-fixing technology

by: Hamza Fahmy
Posted: Jul 30, 2024 / 06:24 PM PDT
Updated: Jul 31, 2024 / 03:47 PM PDT

SAN FRANCISCO – JULY 08: A sign advertising an apartment for rent is displayed in a window July 8, 2009 in San Francisco, California. As the economy continues to falter, vacancy rates …
Read More

Recommendation: Enhance the *Enforceability* of Price Fixing Laws

Final Note: The Power of a Coalition Matters.

EX 213

Thank you!

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