

US & Canada

A Review of the Economic Evidence on Noncompete Agreements

By Gabriella Monahova & Kate Foreman | NERA Economic Consulting



Edited by Justin Stewart-Teitelbaum & Angela Landry

A Review of the Economic Evidence on Noncompete Agreements

By Gabriella Monahova & Kate Foreman¹

I. Introduction

In January, the FTC proposed a rule that would ban essentially all noncompete agreements (“noncompetes” or “NCAs”) in employment contracts.² Noncompetes are clauses that restrict an employee’s ability to work for competitors or set up a competing business, usually within a specific time frame and limited to a defined geographic area, following termination of employment. An estimated 18 percent of the US workforce is subject to a noncompete.³ While noncompetes are generally assumed to protect intellectual property and firm investment in high-paid workers, one report finds that “the *modal* worker bound by an NCA is paid by the hour, with median wages of \$14,” and “hourly workers make up 53% of NCA signers across the US.”⁴ Enforcement of noncompetes is presently governed by state law and there are significant differences in enforceability between states, with some states like North Dakota that ban all noncompetes and others like Florida that permit them in most situations.⁵

This article reviews the recent theoretical and empirical economic research on the effects of noncompetes on various outcomes that inform the debate on the merits of the proposed ban.⁶ In sum, existing research does not unequivocally support implementation of a near-total ban on noncompetes of the type proposed

by the FTC. However, the research does suggest that prohibiting noncompetes may be appropriate in certain contexts. Further theoretical and empirical economic research should be done to determine whether there are additional contexts in which prohibiting noncompetes is appropriate, or even whether they should be prohibited altogether.

II. Noncompetes in Theory – Benefits and Costs

A. Benefits

The theoretical benefits of noncompetes are several. A 2016 report prepared by the United States Department of the Treasury explains that noncompetes may be used to protect trade secrets, which in turn can improve worker productivity and promote innovation.⁷ Specifically, both firm and worker gain when trade secrets such as intellectual property are shared with the worker to improve her productivity, but absent a noncompete, nothing stops the worker from taking those trade secrets to a competitor or using them as leverage to ask for higher compensation.⁸ As a result, employers who cannot impose noncompete clauses may be reluctant to share information that makes workers more productive.

Noncompetes also may incentivize employers to invest in training, as employees are less likely

¹ Dr. Gabriella Monahova and Dr. Kate Foreman are Associate Directors in the Antitrust & Competition practice of NERA Economic Consulting. Dr. Monahova is based in Washington, DC and Dr. Foreman is based in San Francisco.

² Press Release, Federal Trade Commission, FTC Proposes Rule to Ban Noncompete Clauses, Which Hurt Workers and Harm Competition (Jan. 5, 2023), <https://www.ftc.gov/news-events/news/press-releases/2023/01/ftc-proposes-rule-ban-noncompete-clauses-which-hurt-workers-harm-competition>.

³ Evan P. Starr, J. J. Prescott & Norman D. Bishara, *Noncompete Agreements in the U.S. Labor Force*, 64 J. L. ECON., 53 (2021).

⁴ Michael Lipsitz & Evan Starr, *Low-Wage Workers and the Enforceability of Noncompete Agreements*, 68 MGMT. SCI. 143, 144 (2021).

⁵ Matthew S. Johnson et. al, *The Labor Market Effects of Legal Restrictions on Worker Mobility* 12–13 (Oct. 12, 2021) (unpublished manuscript), <https://ssrn.com/abstract=3455381>. For a detailed description of the status of states’ noncompete enforcement, see BECK REED RIDEN LLP, EMPLOYEE NONCOMPETES – A STATE BY STATE SURVEY (Aug. 14, 2013), <https://beckreeriden.com/wp-content/uploads/2012/09/Noncompetes-50-State-Survey-Chart-20130814.pdf>.

⁶ We do not present an exhaustive review of the entire literature on noncompetes. Rather, we aim to highlight different strands in the literature and present some of the most recent representative papers.

⁷ U.S. DEP’T OF THE TREASURY, NON-COMPETE CONTRACTS: ECONOMIC EFFECTS AND POLICY IMPLICATIONS 7 (2016), https://home.treasury.gov/system/files/226/Non_Compete_Contracts_Economic_Effects_and_Policy_Implications_MAR2016.pdf.

⁸ The report notes that there may be other ways to protect trade secrets, such as existing laws prohibiting their disclosure, and that this justification for noncompetes is less applicable to employees who do not have access to trade secrets. See *id.* at 8, 11.

to quit and take their newly developed skills to a competitor, an issue often referred to as the “holdup problem.” Barnett and Sichelman argue that it may be the absence of a noncompete that leads to inefficient outcomes, because unless the employee compensates the employer for the prospective investment in her training, the employer may underinvest in training, skew investments in a less efficient manner (e.g., by limiting knowledge transfers between employees on different teams), or not hire as many employees as it otherwise would.⁹

Finally, if presented prior to signing the job offer, noncompetes may help match employers with high turnover costs to employees who do not want to switch jobs.

To the extent noncompetes indeed bring about these benefits, they may lead to higher wages due to workers’ increased productivity and/or because workers are compensated to agree to this restriction in mobility.¹⁰ The fact that noncompetes are voluntarily signed by employees is often cited as evidence that they must be beneficial, or at least not harmful, to both employer and employees.¹¹

B. Costs

The Treasury Department report describes several possible reasons noncompetes may be harmful: by restricting worker mobility, noncompetes may (i) decrease workers’ leverage in wage (or other) negotiations with employers, (ii) force workers to abandon their occupations entirely, leading to loss of accumulated training and experience, (iii) deny workers the opportunity to develop their skills and careers at other places that may be better suited to their advancement, (iv) decrease labor

market churn, which in turn decreases productivity by curtailing improvements in the employer-employee matching process, and (iv) deprive competitors of the ability to offer better terms and gain valuable employees.¹² More specifically, while some employees may be able to turn down an offer that is contingent on signing a noncompete, others (particularly those applying to low-wage positions) may not have the leverage to do so or may not even be aware that they are signing a noncompete. In addition, new firms are often founded by employees of established firms, who are uniquely situated to compete with their former employers, and noncompetes prevent or make more difficult such employee spinoffs that ostensibly enhance competition.¹³ The transfer of specialized knowledge or skills to a competitor entails a trade-off: while it may induce the previous employer to share less than the efficient amount of information, the knowledge dissemination that does happen may be good for consumers as competitors can build on that knowledge and create even better or lower-cost products.¹⁴ Finally, noncompetes may hinder the dissolution of poor firm-worker matches and may even prevent employees from leaving an abusive or exploitative employer.¹⁵ If noncompetes suppress wages, the effects may be felt not only by workers who are bound by them, but also by other workers in the same markets or industries.

III. Empirical Evidence on Noncompetes

The bulk of the empirical research uses differences in the enforceability of noncompetes across states and over time, usually by applying

⁹ Jonathan M. Barnett & Ted Sichelman, *The Case for Noncompetes*, 87 U. CHI. L. REV. 953, 971 (2020).

¹⁰ Evan Starr, *Are Noncompetes Holding Down Wages?* 5-6 (Harv. U., Working Paper, 2018), https://lwp.law.harvard.edu/files/lwp/files/webpage_materials_papers_starr_june_13_2018.pdf.

¹¹ See, e.g., David J. Balan, *Labor Noncompete Agreements: Tool for Economic Efficiency or Means to Extract Value from Workers?* 20 (Washington Center for Equitable Growth, Working Paper, 2021), <https://equitablegrowth.org/working-papers/labor-non-compete-agreements-tool-for-economic-efficiency-or-means-to-extract-value-from-workers/>.

¹² U.S. DEPT OF THE TREASURY, *supra* note 7, at 9–10.

¹³ Michael Lipsitz & Mark J. Tremblay, *Noncompete Agreements and the Welfare of Consumers* 1 (Social Science Research Network, Working Paper, 2022), <https://ssrn.com/abstract=3975864>. This paper develops a model of market competition with NCA use, which shows that NCAs that prevent such employee spinoffs may have a harmful effect on consumers (apart from their effect on employees) due to their implication for decreasing competition from new entrants. See also Eric A. Posner, *The Antitrust Challenge to Covenants Not to Compete in Employment Contracts*, 83 ANTITRUST L.J. 165 (2020), which argues for a stronger antitrust regime that treats noncompetes as presumptively illegal.

¹⁴ Balan, *supra* note 11.

¹⁵ *Id.* at 6.

difference-in-differences empirical models,¹⁶ to measure the effects of noncompete enforceability on different outcomes. Researchers take this approach because data on differences in enforceability and state-level outcomes are readily available. However, this method may not fully determine how the actual presence of noncompetes affects workers and firms, because there are many workers who are not bound by noncompetes in states that enforce them (and vice versa). There are a few studies that make use of data on workers who have signed noncompete agreements to address this issue. In this section we first review the literature on the effects of enforceability on various outcomes (indirect effects of noncompetes), and then look at the studies that evaluate the effects of the presence of noncompetes (direct effects of noncompetes). Most studies on indirect effects find that noncompetes are associated with lower wages and worker mobility, especially for women, non-white, and less educated workers, and are also associated with increases in firm investments in training and capital. Studies on direct effects more often find that noncompetes are linked to higher wages, but there is evidence that this result may not be causal and may be driven by other factors, not just the presence of a noncompete.

A. Effects of Noncompete Enforceability on Employment Outcomes

Wages and worker mobility are the outcomes that have received the most attention by empirical researchers studying noncompetes. In a recent study, Balasubramanian et al.¹⁷ use the change in companies' ability to include noncompetes or agreements among competitors not to solicit each other's

employees ("nonsolicits") for newly hired technology workers in Hawaii. They find that the ban on noncompetes increased employee mobility by 11 percent and new-hire wages by 4 percent.¹⁸ After 8 years, workers who started a new job in a state where noncompetes were enforceable had worked on average 8 percent fewer jobs and earned almost 5 percent less during that time than workers who started in a state where noncompetes are not enforceable.¹⁹ Young also finds positive effects on employee mobility from a ban on noncompetes (this one in Austria), but no effect on workers wage growth rates.²⁰

Another study, by Lipsitz and Starr, assesses the effects of Oregon's ban on noncompetes for hourly workers,²¹ finding that hourly wages increased by 2 to 3 percent on average, and by up to 6 percent over the seven years following the ban.²² Importantly, the authors found larger effects in occupations where noncompetes were previously more common and double the increase for female workers. Further, the authors found that the noncompete ban led to increased mobility and did not affect hours worked. However, the authors did find that workers were more likely to be switched from hourly to salaried (and thus not subject to the ban), especially those who had been paid just above the wage threshold.

Another study constructs an "enforceability score" for each state, with higher scores given to states where noncompetes are more easily enforceable. The authors find that that higher enforceability scores are associated with lower wages and labor mobility, and that these effects, which are twice as high for women and non-white workers, contribute to wage inequality in the United States.²³ The authors also found that

¹⁶ In this context, the difference-in-differences ("DID") approach compares changes in outcomes (e.g., wages) in states with lower or no enforceability to changes in outcomes in states with higher enforceability. Often an event such as a ban on noncompetes is used to make the comparison. For a more general description of the DID approach, see e.g., The World Bank, *Difference-in-Differences*, DIMEWIKI, <https://dimewiki.worldbank.org/Difference-in-Differences>.

¹⁷ Natarajan Balasubramanian et al., *Locked In? The Enforceability of Covenants Not to Compete and the Careers of High-Tech Workers*, 57 J. HUM. RES. 349 (2022).

¹⁸ *Id.*

¹⁹ *Id.*

²⁰ Samuel G. Young, *Noncompete Clauses, Job Mobility, and Job Quality: Evidence from a Low-Earning Noncompete Ban in Austria* (July 5, 2021) (unpublished manuscript), <https://ssrn.com/abstract=3811459>.

²¹ Lipsitz & Starr, *supra* note 4.

²² *Id.* at 2.

²³ Johnson et. al., *supra* note 5, at 2, 4.

these effects spill over to workers who are not bound by the clauses. They hypothesize that spillover effects result from negative externalities caused by noncompetes, such as “reducing labor market churn, thinning labor markets, or increasing recruitment costs.”²⁴ The authors estimate that if noncompetes were to be made unenforceable nationwide, the average earnings of all workers would increase by 3 to 14 percent.²⁵ Similarly, according to a different study, in state-industry pairs where noncompetes are more enforceable, even workers who are not bound by a noncompete receive fewer job offers, move jobs at a lower rate, and have lower wages.²⁶

In a paper that evaluates the effects of noncompete enforceability on wages and work training, Starr finds a positive effect on training (a 14 percent increase), but a negative effect on hourly wages (a 4 percent decrease) with the wage loss higher for less-educated workers.²⁷ More specifically, the increase in training relates to firm-sponsored skill-upgrading training, but not to self-sponsored training, and the author suggests that this may reflect the fact that the firm is always aware of its noncompete policy but workers sometimes are not. Further, Starr finds that the wage decrease is driven by states that do not require any additional compensation or other considerations provided to the worker in exchange for signing a noncompete.

Focusing on the differential impacts on mobility for men and women, Marx²⁸ finds that where noncompetes are more broadly enforceable, women are less likely than men to quit their employer and start a rival company. The noncompete may not only make it harder for the employee to leave her firm but also hinder her ability to hire talented employees with relevant

skills and experience to make the startup successful. The author ascribes this finding to women exhibiting greater risk aversion and so being less willing to risk litigation from a former employer.²⁹

B. Effects of Noncompete Enforceability on Firm Outcomes

Hiraiwa, Lipsitz, and Starr use a change in the enforceability of noncompetes in Washington State to measure the value of enforceability to firms.³⁰ In 2020, Washington banned the enforcement of noncompetes against workers who earn \$100,000 or less. Using earnings data from 2001 to 2021, the researchers found that the ability to enforce noncompetes at this level was not valued by firms and that the ban did not destroy firm value. The authors suggest possible reasons for a lack of effect, including that firms have other tools to protect their interests and that firms do not need noncompetes to be enforceable in order to have value.

A 2019 paper examines the interplay between noncompete enforceability and firms’ R&D investments.³¹ Using data on patent applications, the author finds that in states where enforcement of noncompetes is more broadly permissible, firms undertake riskier R&D investments than comparable firms in states where noncompetes are less or not at all enforceable. This is consistent with the hypothesis that by protecting knowledge leads to competitors, noncompetes enable firms to realize more benefits from R&D investments. Finally, Jeffers uses LinkedIn data on employment histories to test the effect of noncompete enforceability on capital investments at knowledge-intensive firms.³²

²⁴ *Id.* at 3.

²⁵ *Id.* at 19.

²⁶ Evan Starr, Justin Frake & Rajshree Agarwal, *Mobility Constraint Externalities*, 30 ORG. SCI. 869 (2018).

²⁷ Evan Starr, *Consider This: Training, Wages, and the Enforceability of Covenants Not to Compete*, 72 INDUS. & LAB. RELS. REV. 783, 785 (2019).

²⁸ Matt Marx, *Employee Non-Compete Agreements, Gender, and Entrepreneurship* 33 ORG. SCI. 1756, 1766 (2021).

²⁹ *Id.* at 1760–1761.

³⁰ Takuya Hiraiwa, Michael Lipsitz & Evan Starr, *Do Firms Value Court Enforceability of Noncompete Agreements? A Revealed Preference Approach* (February 20, 2023) (unpublished manuscript), <https://ssrn.com/abstract=4364674>.

³¹ Raffaele Conti, *Do Non-Competition Agreements Lead Firms to Pursue Risky R&D Projects?*, 35 STRATEGIC MGMT. J. 1230 (2014).

³² Jessica Jeffers, *The Impact of Restricting Labor Mobility on Corporate Investment and Entrepreneurship* (April 19, 2023) (unpublished manuscript), <https://ssrn.com/abstract=3040393>.

She finds that stronger enforceability leads to a decrease in employee departures and entrepreneurship but also to an increase in investments in existing firms by an average of approximately \$2 million for every lost new firm entry.

C. Effects of the Use of Noncompetes

The studies discussed in the previous sections measure the *indirect* impact of noncompetes by looking at the impact of enforceability rather than the actual use of such contracts. Indirect studies are more numerous primarily due to the scarcity of representative time series data indicating whether workers actually signed a noncompete, which is needed for researchers to test the causal effects of these covenants. However, there are several studies that provide some insight into the *direct* effects of noncompetes by utilizing data from surveys that specifically ask employees whether they have signed a noncompete.³³

For example, Lavetti, Simon, and White use data from a survey of primary care physicians and find that noncompetes are frequently used in that industry.³⁴ They also find evidence supporting the hypotheses that physician practices use noncompetes to prevent patients from being poached, that noncompetes increase the rate of return to physicians staying longer with the same practice, and that practices that have noncompetes are more likely to share patients through referrals.³⁵

Johnson and Lipsitz use survey data from hair salon owners to assess the interplay between minimum wage laws and noncompetes to try to understand why noncompetes may be used in low-wage occupations, where they appear to be economically suboptimal.³⁶ The authors hypothesize that when employers and workers

cannot use wage to equilibrate the labor market – in other words, minimum wage laws prevent labor supply and demand from meeting at the economically optimal wage – noncompetes may be used as a tool to transfer utility from the worker to the employer. They find that minimum wage increases lead to more usage of noncompetes, but only at firms where the benefit to the employer from the noncompete is lower than the cost to the worker.³⁷ This is evidence that some uses of noncompetes cause net harm to society. The authors explain that banning noncompetes might decrease hiring by firms not productive enough to hire workers without a noncompete, and it might increase surplus in firms that are productive enough. Thus, they conclude that the welfare effect from a ban on noncompetes depends on various factors.

Researchers have also studied the link between the nature of the noncompete contracting process and employment outcomes. Starr, Prescott & Bishara use nationally representative survey data to analyze the timing of the introduction of noncompete clauses (*i.e.*, before or after an employee has accepted a job offer).³⁸ The authors find that noncompetes “are associated with more training, greater access to information, and higher wages and job satisfaction when the noncompete is present along with the job offer” compared to situations when the noncompete is presented after the acceptance of a job offer. The authors point out that this evidence supports the hypothesis that workers who knowingly and voluntarily sign a noncompete are compensated for it, and so when the noncompete is presented before the job offer is accepted, it may be an effective tool to solve the holdup problem. This suggests that if workers are only made aware of a

³³ Besides the studies reviewed in this sub-section, other papers that look at the direct effects of use of noncompetes include Stewart Schwab & Randall Thomas, *An Empirical Analysis of CEO Employment Contracts: What Do Top Executives Bargain For?*, 63 WASH. & LEE L. REV. 231 (2005); Randall Thomas et al., *An Empirical Analysis of Noncompetition Clauses and Other Restrictive Postemployment Covenants*, 68 VAND. L. REV. 1 (2015); Matt Marx, *Firm Strikes Back: Non-Compete Agreements and the Mobility of Technical Professionals*, 76 AM. SOCIO. REV. (2011).

³⁴ Kurt Lavetti, Carol J. Simon & William White, *The Impacts of Restricting Mobility of Skilled Service Workers: Evidence from Physicians*, 55 J.HUM. RES.1025 (2020).

³⁵ *Id.* at 1027–29.

³⁶ Matthew S. Johnson and Michael Lipsitz, [Why Are Low-Wage Workers Signing Noncompete Agreements?](#), 57 J. HUM. RES. 689 (2022).

³⁷ *Id.* at 691.

³⁸ Starr, Prescott & Bishara, *supra* note 3.

noncompete after they have signed an offer, the noncompete would not bring about such benefits.

Rothstein and Starr³⁹ explore newly available data from a long-running national survey that allows them to assess the direct effects of the use of noncompetes across occupations and over time. The data provides interesting insights into the incidence of noncompetes: they are more common among people who earn higher wages (with a difference of 23 percentage points between those in the lowest and highest wage deciles), more common for people with bachelor's degrees than without (a difference of 9 percentage points), and are more frequently found in occupations such as engineering (where 38 percent of the sample have signed a noncompete), computer science (36 percent), sales (28 percent), and management (24 percent), while much less common in food preparation (7 percent) and social services (4 percent).⁴⁰ Further, noncompete incidence in the data is not meaningfully different in states that do not enforce these covenants (California, North Dakota, and Oklahoma) compared to other states.⁴¹ The authors' empirical analysis finds that workers who have signed a noncompete have higher wages than workers who have not signed one, but they caution that these results should be interpreted as indicating correlation and not causation. Since noncompetes are more common in technical occupations and for workers with more education, it is not surprising that they are correlated with higher wages. The authors can control for some of these variables, but not all of them – there may be other unobservable characteristics that make some employees both more likely to earn a higher wage and to sign a noncompete (e.g., access to trade secrets or type of tasks performed on the job).⁴² In addition, the authors find that the positive

relationship between noncompetes and wage is meaningfully smaller for workers that do not bargain over their wages, have less education, or live in a state that enforces noncompetes.⁴³

In a very recent paper, Shi⁴⁴ builds a detailed structural model of a labor market with dynamic wage contracts, firm investments in employees, and noncompetes of flexible duration from which workers may be released in exchange for a buyout payment. The model shows that the noncompete and the associated buyout clause discourage new firm entrants who are not able to lure workers away from their current employers. The model also shows increased incentives for employers to invest in workers' human capital. The net effect is noncompete contracts that are of excessively long duration compared to what is socially optimal. The author applies the model to data from the managerial labor market and finds that noncompetes cause a large negative effect on mobility and a small positive effect on firm investment, concluding that a near-total ban on noncompetes is the socially optimal policy.

One complication in measuring the effects of noncompetes is that a firm deploying a noncompete might simultaneously deploy other employment restrictions, including nondisclosure agreements, nonsolicits, and nonrecruitment agreements. Balasubramanian et al.⁴⁵ find that noncompetes are the least commonly used restriction, and that firms that impose any restrictions, generally deploy either just a nondisclosure agreement or all four restrictions. Furthermore, they find that outcomes for employees facing all four restrictions are different than those for employees facing a single restriction. Curiously, the authors find that in their data, workers that are not bound by any of these restrictions earn the lowest wages, while those with all four restrictions earn less than those with just a

³⁹ Donna S. Rothstein & Evan Starr, *Mobility Restrictions, Bargaining, and Wages: Evidence from the National Longitudinal Survey of Youth 1997* (Nov. 2021) (unpublished manuscript), <https://ssrn.com/abstract=3974897>.

⁴⁰ *Id.* at 8.

⁴¹ *Id.* at 9.

⁴² *Id.* at 12.

⁴³ *Id.* at 19.

⁴⁴ Liyan Shi, *Optimal Regulation of Noncompete Contracts*, 91 *ECONOMETRICA* 425 (2023).

⁴⁵ Natarajan Balasubramanian, Evan Starr & Shotaro Yamaguchi, *Employment Restrictions on Resource Transferability and Value Appropriation from Employees* (Jan. 2023) (unpublished manuscript), <https://ssrn.com/abstract=3814403>.

nondisclosure. They hypothesize that workers that face no restrictions are likely a non-representative lower-wage group, and that studies that find a positive relationship between noncompetes and wages (such as Rothstein and Starr⁴⁶) likely reflect the usage of all four restrictions, not just noncompetes.

IV. Discussion

In order to assess the merits of a national and unconditional ban on noncompete agreements, we would ideally have sufficient theoretical and empirical evidence to answer the question, “are noncompetes overall beneficial or harmful?” The recent economic research has made great strides toward an answer, but more work is needed.

There are both sound theoretical arguments and strong empirical support for the claim that noncompetes encourage capital and R&D investments by firms. Banning all noncompetes outright may thus result in decreased innovation and firm investments. However, there is also strong evidence that noncompetes decrease worker mobility; limit entrepreneurship (and therefore competition); and disproportionately affect women, less-educated workers, and those who are less able to bargain over their work contracts, such as workers in low-wage occupations. For these types of occupations,

the theoretical support for noncompetes is also the least convincing. This evidence suggests that it may be worthwhile to consider the following policies: (i) partial bans for workers who earn less than a specific wage threshold or are employed in particular occupations; (ii) partial bans on noncompete clauses that prevent employees from starting their own business, while still allowing those that restrict moves to a competitor; and (iii) requiring noncompetes to be disclosed before signing a contract and making this process transparent and clear for employees.

The evidence on the effects on wages is not unequivocal, and more research – particularly using data on the use of noncompetes, rather than their enforceability – would help to better understand the tradeoff between the impact on wages from decreased mobility and from firms’ investments in workers’ human capital and R&D. When assessing the tradeoffs stemming from a ban, policymakers should also keep in mind the evidence that noncompetes affect not only employees bound by them, but other workers in the same or adjacent markets and industries. Another consideration when assessing the merits of a ban should be what firms would do to achieve the same ends and what the effects of alternative contractual restrictions may.

⁴⁶ See Rothstein & Starr, *supra* note 39.