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Noncompetes and Other Post-Employment Restraints on Competition: Empirical Evidence from Trade Secret Litigation

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Noncompetes and Other Post-Employment Restraints on Competition: Empirical Evidence from Trade Secret Litigation

CHRISTOPHER B. SEAMAN[†]

Noncompete clauses in employment agreements are both common and controversial. An estimated twenty-eight million Americans—nearly twenty percent of the U.S. workforce—are currently bound by a noncompete. The traditional view that noncompete agreements can facilitate increased productivity by encouraging employers to invest in employee training has been challenged by numerous legal and economics scholars in recent years, who contend noncompetes hinder employment options for skilled workers and limit information spillovers, which are both vital drivers of innovation. Based on these claims, several states have recently limited the enforcement of noncompetes, and legislation is pending at the federal level to effectively ban noncompete agreements for certain types of workers.

Despite their widespread use, empirical research regarding noncompetes is fragmented and incomplete. In particular, there have been few empirical studies based on actual employment agreements. This Article helps fill an important gap in the existing literature. Using a novel dataset of noncompete agreements that have been publicly disclosed in trade secret litigation in federal court, it finds that noncompetes are more frequently enforced against technical and sales personnel, instead of high-ranking corporate executives. In addition, it finds that noncompetes are common for employees with a base salary below \$100,000 per year and that California-based employees are significantly less likely to be bound by a noncompete. The implications of these and other findings from the dataset are discussed in the final Part of the Article.

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INTRODUCTION

Contractual provisions that limit an employee's ability to compete with a former employer are both common and controversial.¹ An estimated twenty-eight million employees—nearly twenty percent of the U.S. labor force—are currently bound by a noncompete agreement.² Although existing research suggests covenants not-to-compete and other post-employment restraints on competition, such as non-solicitation agreements, are more common among highly-skilled employees,³ they occur at all levels of the workforce. News stories have highlighted the use of noncompetes in low-wage, low-skill positions,⁴ including fast food employees,⁵ pet sitters,⁶ beauticians,⁷ exterminators,⁸ camp

1. See, e.g., Norman D. Bishara, Kenneth J. Martin & Randall S. Thomas, *An Empirical Analysis of Noncompetition Clauses and Other Restrictive Postemployment Covenants*, 68 VAND. L. REV. 1, 5 (2015) (“Restrictive covenants remain controversial today, even as they have seemingly proliferated among employers.”) (footnote omitted); Gillian Lester, *Restrictive Covenants, Employee Training, and the Limits of Transaction-Cost Analysis*, 76 IND. L.J. 49, 49 (2001) (explaining that “restrictive covenant[s] prohibit[ing] an employee from competing with the employer within a certain geographic area for a specified time period after departure” are “an increasingly common feature of employment, used across a wide range of industries, occupations, and employees”); Viva R. Moffat, *The Wrong Tool for the Job: The IP Problem with Noncompetition Agreements*, 52 WM. & MARY L. REV. 873, 876 (2010) (“As the use of noncompetes has become more widespread, controversy over these agreements has also increased.”).

2. Evan Starr, J.J. Prescott & Norman Bishara, *Noncompete Agreements in the U.S. Labor Force*, J.L. & ECON. (forthcoming 2021) (manuscript at 5), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2625714.

3. *Id.* at 6–7.

4. See Sophie Quinton, *These Days, Even Janitors Are Being Required to Sign Non-Compete Clauses*, USA TODAY (May 27, 2017, 8:28 AM), <https://www.usatoday.com/story/money/2017/05/27/noncompete-clauses-jobs-workplace/348384001> (“Big companies often ask top executives who have access to confidential business information to sign noncompete agreements. But low-wage, unskilled laborers such as janitors, landscapers and entry-level health workers are often asked to sign them, too.”).

5. In one well-publicized example, the sandwich chain Jimmy John's required its “sandwich makers” to agree not to work at a “competitor” (which it broadly defined as any business that “derives more than ten percent (10%) of its revenue from selling submarine, hero-type, deli-style, pita and/or wrapped or rolled sandwiches” that is “located with [sic] three (3) miles” of any Jimmy John's store) for two years after employment. Dave Jamieson, *Jimmy John's Makes Low-Wage Workers Sign 'Oppressive' Noncompete Agreements*, HUFFPOST (Oct. 15, 2014), https://www.huffpost.com/entry/jimmy-johns-non-compete_n_5978180. After litigation, Jimmy John's agreed that it would not enforce noncompetes for all current and former employees and to remove them from training materials for new hires. See Samantha Bomkamp, *Jimmy John's Agrees to Pay \$100,000 to Illinois AG over Noncompete Contracts*, CHI. TRIB. (Dec. 7, 2016, 2:11 PM), <http://www.chicagotribune.com/business/ct-jimmy-johns-settlement-1208-biz-20161207-story.html>.

6. See, e.g., Dave Jamieson, *Doggy Day Care Chain Makes Pet Sitters Sign Noncompetes to Protect 'Trade Secrets'*, HUFFPOST (Nov. 24, 2014, 7:31 AM), https://www.huffpost.com/entry/camp-bow-wow_n_6207544; see also *Paw Shop, LLC v. Mestre*, No. 601950/08, 2008 WL 8675213 (N.Y. Sup. Ct. Oct. 28, 2008) (granting a preliminary injunction that prohibited a former employee from providing dog walking services to owners whose pets were serviced by the plaintiff within a ten mile radius of the former employer's stores based on a noncompete agreement).

7. See, e.g., Koby Levin, *As Non-Compete Agreements Proliferate, So Do Lawsuits*, ASSOCIATED PRESS (Mar. 22, 2018), <https://www.apnews.com/70f0855282de4329908957fa7b1e278d> (describing a noncompete that prevented a hair stylist in Missouri from accepting a position with another salon).

8. See, e.g., *Paramount Termite Control Co. v. Rector*, 380 S.E.2d 922, 925–26 (Va. 1989) (upholding a noncompete agreement prohibiting a pest control worker from working for a competitor for two years after termination of employment), *overruled by Home Paramount Pest Control Companies, Inc. v. Shaffer*, 718 S.E.2d 762 (Va. 2011).

counselors,⁹ and college interns.¹⁰ These restraints may adversely impact workers' ability to negotiate with their existing employer and to switch positions, potentially depressing wages and decreasing labor mobility.¹¹

There are divergent theories regarding the impact of noncompetes and other post-employment restraints on innovation. The historically dominant view is that noncompetes can facilitate innovation by incentivizing firms to invest in employee training, fostering the dissemination of information within the firm, and preventing the unauthorized disclosure of trade secrets and other valuable business information.¹² Under this approach, the reasonableness standard for evaluating the enforceability of noncompetes¹³—which remains the predominant approach in most jurisdictions¹⁴—adequately protects their benefits to employers while also reducing the negative impact on employees by constraining contractual overreach.

More recently, however, some legal and economics scholars contend that noncompete agreements are generally detrimental to innovation. For example, in a well-known and influential study, Ronald Gilson compared innovation in California's Silicon Valley to Massachusetts's Route 128 corridor and attributed Silicon Valley's success to California's refusal to enforce noncompetes in most circumstances.¹⁵ Building on this work, scholars like Orly Lobel and Viva Moffat have argued that noncompete agreements and other post-employment restraints unduly hinder employment options for skilled workers, who are a critical source of talent and new ideas.¹⁶ In their view, noncompetes effectively

9. See, e.g., Steve Greenhouse, *Noncompete Clauses Increasingly Pop Up in Array of Jobs*, N.Y. TIMES (June 8, 2014), <https://www.nytimes.com/2014/06/09/business/noncompete-clauses-increasingly-pop-up-in-array-of-jobs.html> (describing a noncompete clause that prohibited a nineteen-year-old college student from working as a camp counselor at a nearby competing camp).

10. See, e.g., Jack Chapman, *What If They Want Me to Sign a Non-Compete Agreement?*, LADDERS (Feb. 27, 2020), <https://www.theladders.com/career-advice/they-want-me-to-sign-a-non-compete-agreement> (describing a case where a college student was blocked from accepting employment with the client of an advertising agency that she had interned with due to a noncompete agreement).

11. See WHITE HOUSE, NON-COMPETE AGREEMENTS: ANALYSIS OF THE USAGE, POTENTIAL ISSUES, AND STATE RESPONSES 2 (2016), https://obamawhitehouse.archives.gov/sites/default/files/non-competes_report_final2.pdf.

12. See generally Harlan M. Blake, *Employee Agreements Not to Compete*, 73 HARV. L. REV. 625 (1960); Edmund W. Kitch, *The Law and Economics of Rights in Valuable Information*, 9 J. LEGAL STUD. 683 (1980); Paul H. Rubin & Peter Shedd, *Human Capital and Covenants Not to Compete*, 10 J. LEGAL STUD. 93 (1981).

13. The reasonableness standard for noncompetes can be traced to the landmark English decision in *Mitchel v. Reynolds* (1711) 24 Eng. Rep. 347; 1 P. Wms. 181. See Jonathan M. Barnett & Ted Sichelman, *The Case for Noncompetes*, 87 U. CHI. L. REV. 953, 958 (2020).

14. California is the obvious counterexample. See *infra* notes 48–51 and accompanying text.

15. See generally Ronald J. Gilson, *The Legal Infrastructure of High Technology Industrial Districts: Silicon Valley, Route 128, and Covenants Not to Compete*, 74 N.Y.U. L. REV. 575 (1999); ANNALEE SAXENIAN, *REGIONAL ADVANTAGE: CULTURE AND COMPETITION IN SILICON VALLEY AND ROUTE 128* (1994). But see Barnett & Sichelman, *supra* note 13, at 978–1007 (critiquing conventional views of the Silicon Valley versus Route 128 comparison and suggesting that other legal constraints on labor mobility, such as trade secret and ERISA litigation, undermine this narrative).

16. See, e.g., ORLY LOBEL, *TALENT WANTS TO BE FREE: WHY WE SHOULD LEARN TO LOVE LEAKS, RAIDS, AND FREE RIDING* (2013); Moffat, *supra* note 1, at 893–97; Viva R. Moffat, *Making Non-Competes Unenforceable*, 54 ARIZ. L. REV. 939, 984 (2012).

serve as human capital controls.¹⁷ Ultimately, critics of noncompetes argue that they stifle rather than promote innovation, which in turn can negatively impact economic growth.¹⁸ In addition, some economists and business law scholars have conducted studies which suggest that noncompetes adversely affect the mobility of skilled labor.¹⁹ In light of these critiques, legislation has been introduced in Congress to significantly restrict the enforcement of noncompetes,²⁰ and the Federal Trade Commission (FTC) recently held a public hearing regarding their potential anticompetitive effects.²¹ Furthermore, numerous states recently have enacted laws curtailing noncompetes, often by prohibiting their application to lower-income workers.²²

17. See Orly Lobel, *The New Cognitive Property: Human Capital Law and the Reach of Intellectual Property*, 93 TEX. L. REV. 789, 790 (2015) (describing “postemployment restrictions, including noncompetition contracts, nonsolicitation, nonpoaching, and antidealing agreements” as forms of “contractual controls on human capital”); Viva R. Moffat, *Human Capital as Intellectual Property? Non-Competes and the Limits of IP Protection*, 50 AKRON L. REV. 903, 907 (2017) (“The subject matter of non-competes is people—human beings—and the goal of those agreements is to control that human capital.”).

18. See *infra* notes 77–84 and accompanying text.

19. See, e.g., Matt Marx, Deborah Strumsky & Lee Fleming, *Mobility, Skills, and the Michigan Non-Compete Experiment*, 55 MGMT. SCI. 875 (2009) (using change in noncompete law in Michigan during the 1980s as a natural experiment and finding a statistically significant decrease in labor mobility among Michigan inventors) [hereinafter Marx et al., *The Michigan Non-Compete Experiment*]; Matt Marx, Jasjit Singh & Lee Fleming, *Regional Disadvantage? Employee Non-Compete Agreements and Brain Drain*, 44 RSCH. POL’Y 394 (2015) (finding that noncompetes drive skilled workers to states that decline to enforce such agreements) [hereinafter Marx et al., *Regional Disadvantage?*]; Sampa Samila & Olav Sorenson, *Noncompete Covenants: Incentives to Innovate or Impediments to Growth*, 57 MGMT. SCI. 425 (2011).

20. See, e.g., Workforce Mobility Act of 2020, H.R. 5710, 116th Cong. (2020); Workforce Mobility Act of 2019, S. 2614, 116th Cong. (2019); Workforce Mobility Act of 2018, S. 2782, 115th Cong. (2018); Workforce Mobility Act of 2018, H.R. 5631, 115th Cong. (2018).

21. *Non-Competes in the Workplace: Examining Antitrust and Consumer Protection Issues*, FED. TRADE CMM’N, <https://www.ftc.gov/news-events/events-calendar/non-competes-workplace-examining-antitrust-consumer-protection-issues> (last visited Apr. 19, 2021).

22. See CAL. LAB. CODE § 925 (West 2021) (prohibiting employers from entering into choice of forum or choice of law agreements with California workers); S.B. 3163, 99th Gen. Assemb. (Ill. 2016) (codified at 820 ILL. COMP. STAT. 90 *et seq.* (2017)) (prohibiting employers from entering into noncompetes with low-wage workers); ME. STAT. tit. 26, §§ 599-A to 599-B (2019) (prohibiting noncompetes where the employee’s wages are at or below 400% of the federal poverty level); S.B. 328, 2019 Leg., Reg. Sess. (Md. 2019) (codified at MD. CODE ANN., LAB. & EMPL. § 3-716 (West 2021)) (prohibiting noncompetes for employees earning \$15 an hour or less, or \$31,200 per year); MASS. GEN. LAWS ch. 149, § 24L (2021) (prohibiting noncompetes for non-exempt employees, interns, and employees 18 years old or younger, and limiting most noncompetes to one year in duration); NEV. REV. STAT. § 613.195 (2020) (requiring employers to offer valuable consideration for noncompetes); S.B. 197, 2019 Leg., Reg. Sess. (N.H. 2019) (codified at N.H. REV. STAT. § 275.70-a (2020)) (prohibiting noncompetes for employees who earn an hourly rate equal to or less than 200 percent of the federal minimum wage); H.B. 2992, 80th Leg. Assemb., Reg. Sess. (Or. 2019) (codified at OR. REV. STAT. § 653.295 (2020)) (limiting noncompetes by, *inter alia*, requiring employers to inform employees at least two weeks before starting work that a noncompete is required, the employee must make more than four times the median family income as calculated by the Census Bureau, and the duration of the noncompete agreement is limited to 18 months following termination of employment); 28 R.I. GEN. LAWS § 28-59-3 (2020) (similar to Massachusetts); S.B. 480, 2020 Leg., Reg. Sess. (Va. 2020) (codified at VA. CODE ANN. § 40.1-28.7:8 (2021)) (prohibiting noncompetes for certain low-wage employees); H.B. 1450, 66th Leg., Reg. Sess. (Wash. 2019) (codified at WASH. REV. CODE §§ 49.62.020–.030 (2021)) (prohibiting noncompetes against employees making equal to or less than \$100,000 and independent contractors making equal to or less than \$250,000 annually, and presuming

Despite their importance, existing empirical research regarding the scope, frequency, and impact of noncompete agreements and other post-employment restraints on competition remains fragmented and incomplete.²³ Moreover, many of the empirical studies conducted thus far have significant limitations based on the methodologies and data sources used, a focus on particular types of employees (for example, CEOs and doctors), and/or the timing of the study.²⁴ In particular, very few studies “examin[e] the terms of actual employment contracts” regarding noncompetes because “employment contracts are not generally publicly available.”²⁵

This Article aims to make a substantial, new contribution to the growing but inchoate body of empirical research regarding noncompetes and other post-employment restraints. Specifically, it uses a hitherto-untapped data source: breach of employment contract claims asserted as part of trade secret litigation in federal court under the Defend Trade Secrets Act.²⁶ Using this resource, the Author created an original dataset of over 500 noncompete agreements and other contractual limitations on post-employment competition. Each of these agreements were then hand coded for a variety of information, including the employee’s job position, his or her salary, the duration and scope of the noncompete clause, and the relevant governing law.

Several interesting findings emerge from this dataset, including that half of post-employment restraints on competition in trade secret litigation involve claims against technical, engineering, customer service, or sales staff, rather than high-ranking corporate executives, and that over a quarter of noncompetes apply to employees who have a base salary of \$100,000 per year or less. This study also found evidence supporting the existence of the so-called “California effect”; namely, that employment agreements covering California employees are substantially less likely to include a covenant not-to-compete. Instead,

that any noncompete with a duration exceeding 18 months after termination of employment is unreasonable and unenforceable).

23. See Bishara et al., *supra* note 1, at 10 (“Despite the heated discussion of the pros and cons of restrictive covenants . . . there are few empirical studies examining these agreements to provide evidence and guidance for businesses, employees, or policymakers.”); Norman D. Bishara & Evan Starr, *The Incomplete Noncompete Picture*, 20 LEWIS & CLARK L. REV. 497, 500 (2016) (“[T]he existing legal and empirical research on the prevalence and impacts of noncompetes in the U.S. labor market remains piecemeal and unsatisfactory.”); J.J. Prescott, Norman D. Bishara & Evan Starr, *Understanding Noncompetition Agreements: The 2014 Noncompete Survey Project*, 2016 MICH. ST. L. REV. 369, 372 (“[W]e know surprisingly little about the frequency, scope, and strength of noncompetition agreements across the country.”).

24. See Bishara et al., *supra* note 1 (reporting the results of a sample of employment contracts for Chief Executive Officers of large, publicly-traded firms disclosed in federal securities filings); Kurt Lavetti, Carol Simon & William D. White, *The Impacts of Restricting Mobility of Skilled Service Workers: Evidence from Physicians*, 55 J. HUM. RES. 1025 (2020) (reporting results from a 2007 survey of physicians regarding noncompete clauses by state and employment status); Prescott et al., *supra* note 23 (using self-reported responses from an online survey); Peter J. Whitmore, *A Statistical Analysis of Noncompetition Clauses in Employment Contracts*, 15 J. CORP. L. 483 (1990) (studying a sample of appellate decisions on noncompete agreements from the 1960s and 1980s).

25. Bishara et al., *supra* note 1, at 10, 24.

26. Defend Trade Secrets Act of 2016, Pub. L. No. 114-153, 130 Stat. 376.

California firms appear to rely on non-solicitation agreements—which prohibit an employee from lobbying customers or recruiting employees or their former employer—as a substitute. Ultimately, the methodology used for this study can serve as a springboard for future research regarding not just noncompetes, but a variety of contractual provisions that may affect innovation policy, such as nondisclosure agreements and invention assignment clauses.

The remainder of this Article proceeds as follows. Part I provides an overview of the various types of contractual provisions that may limit an employees' ability to compete with their former employer. It then discusses the various theories regarding the role of covenants not-to-compete in innovation policy and the development of human capital. Next, it summarizes the existing empirical research regarding noncompetes, including the limitations of prior research. Part II describes the research objectives, study design, and data collection process for this empirical research project. It also notes several potential methodological limitations of this study. Part III explains the key findings from the dataset. Finally, Part IV discusses some implications of these results and potential directions for future research.

I. POST-EMPLOYMENT RESTRAINTS ON COMPETITION AND INNOVATION POLICY

A. AN OVERVIEW OF POST-EMPLOYMENT RESTRAINTS

Employers have used contract law to limit the ability of former employees to compete against them for hundreds of years.²⁷ While employed, a worker is bound by various legal doctrines that prevent against unfair competition with the employer, such as the duty of loyalty.²⁸ But once a job ends—regardless of the reason—these duties terminate, and “the departing employee is generally free to engage in any lawful competition.”²⁹ As a result, “[t]he employee’s valuable knowledge, skills, and relationships walk out the door when the employee leaves.”³⁰

27. See Blake, *supra* note 12, at 626 (noting covenants not to compete “comprise one of the traditional common-law ‘restraints of trade’ and present problems which have kept them before the courts for more than five hundred years”); see also *id.* at 629–37 (discussing English case and statutory law regarding post-employment covenants dating back to the 1400s).

28. See RESTATEMENT (THIRD) OF EMPLOYMENT LAW § 8.01(a) (AM. L. INST. 2015) (“Employees in a position of trust and confidence with their employer owe a fiduciary duty of loyalty to the employer in matters related to their employment.”); *id.* § 8.01(b)(2) (providing that “competing with the employer while employed by the employer” is a breach of this duty); see also Michael Selmi, *The Restatement’s Supersized Duty of Loyalty Provision*, 16 EMP. RTS. & EMP. POL’Y J. 395, 400 (2012) (“Employees can . . . be seen as agents, and the duty of loyalty generally requires that employees not harm their employer.”).

29. Bishara et al., *supra* note 1, at 11; see also RESTATEMENT (THIRD) OF EMPLOYMENT LAW § 8.05 (“A former employee may compete with, or work for, a competitor of the former employer . . . unless: (a) the former employee is bound by an agreement not to compete . . . or (b) . . . the former employee discloses, uses, or by words or conduct threatens to disclose or use, specifically identifiable trade secrets of the former employer . . .”).

30. Bishara et al., *supra* note 1, at 11.

Understandably, employers are reluctant to let such talent and knowledge voluntarily depart, potentially to the benefit of a competitor. One tool to prevent this is contractual restraints on post-employment competition, which can “temporarily maintain the status quo that existed prior to the employee’s departure,” thus effectively retaining the employer’s “competitive advantage by contract,” at least for a limited time.³¹ Post-employment restraints also can prevent an employee from misappropriating trade secrets (and other confidential business information) by disclosing or using this information to the former employer’s detriment.³² But these same restraints also can interfere with individuals’ personal autonomy and right to earn a living.³³ In addition, because noncompete agreements and other post-employment restraints are facially anticompetitive, they may negatively impact social welfare by reducing entrepreneurship, depressing employee wages and job satisfaction, and preventing the sharing of knowledge and ideas.³⁴

There are several types of contractual post-employment restraints on competition.³⁵ The first, and perhaps best known, is a covenant not-to-compete (CNC).³⁶ CNCs prohibit an employee from joining a competitor or starting a

31. *Id.* at 12.

32. Blake, *supra* note 12, at 627 (“From the point of view of the employer, postemployment restraints are regarded as perhaps the only effective method of preventing unscrupulous competitors or employees from appropriating valuable trade information . . . for their own benefit.”).

33. See LOBEL, *supra* note 16, at 37 (“From the perspective of labor advocates, every man and woman should have the right to earn a living and pursue their profession, and noncompetes . . . and other forms of human capital controls are heavy infringements upon the pursuit of that livelihood and therefore upon happiness.”); Moffat, *supra* note 17, at 911–12 (exploring the impact of noncompetes on employees’ “personal autonomy and dignitary interests”).

34. See LOBEL, *supra* note 16; Robert W. Gomulkiewicz, *Leaky Covenants-Not-to-Compete as the Legal Infrastructure for Innovation*, 49 U.C. DAVIS L. REV. 251, 253–54 (2015) (noting that noncompetes “interfere with the flow of information that naturally results when employees change firms,” which some scholars argue “play a critical role in spurring innovation”); Charles Tait Graves, *Analyzing the Non-Competition Covenant as a Category of Intellectual Property Regulation*, 3 HASTINGS SCI. & TECH. L.J. 69, 89 (2011) (contending that “the non-compete implicitly reflects a policy determination that” protecting employers from trade secret misappropriation “outweighs the potential social gains obtained through innovation, and the compensation and job satisfaction of individual employees who freely join or form competing businesses”); Moffat, *supra* note 17, at 917 (“Employees bound by non-competes tend to have less bargaining power and lower wages or salaries than those free of restriction.”); Christina L. Wu, Comment, *Noncompete Agreements in California: Should California Courts Uphold Choice of Law Provisions Specifying Another State’s Law?*, 51 UCLA L. REV. 593, 609 (2003) (“Competition among employers for employees leads to better wages and working conditions for employees, because employers feel obliged to give their employees good working environments and salaries to induce them to stay.”). In their seminal treatise on the economics of intellectual property law, William Landes and Richard Posner admit that “[i]t is not even clear that enforcing employee covenants not to compete generates social benefits in excess of its social costs.” WILLIAM M. LANDES & RICHARD A. POSNER, *THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW* 371 (2003).

35. Bishara et al., *supra* note 1, at 12 (“There are several typical contract mechanisms employers use to restrict or penalize an employee’s postemployment competition.”).

36. “CNC” appears to be the most common abbreviation in the recent legal and economic literature on covenants not-to-compete. Some articles use “NCA” as an alternative abbreviation. See, e.g., Sharon K. Sandeen & Elizabeth A. Rowe, *Debating Employee Non-Competes and Trade Secrets*, 33 SANTA CLARA HIGH TECH. L.J. 438, 440 (2017).

new firm that would compete with the former employer.³⁷ Many CNCs also prevent former employees from consulting or providing other assistance to a competitor that falls short of a formal employee/employer relationship.³⁸ In addition, CNCs usually preclude an employee from serving as a director or officer for, or taking a substantial ownership interest in, a competing firm.³⁹ CNCs are often expressly limited in time (duration) and geographic scope,⁴⁰ and some CNCs may also preclude the former employee from engaging in specific activities.⁴¹

In most states, CNCs are enforceable if they are reasonable.⁴² Under this “rule of reason” approach, courts generally apply the test articulated in the *Restatement (Second) of Contracts*, which provides that:

- (1) A promise to refrain from competition that imposes a restraint that is ancillary to an otherwise valid transaction or relationship is unreasonably in restraint of trade if
- (a) the restraint is greater than is needed to protect the [employer]’s legitimate interest, or
 - (b) the [employer]’s need is outweighed by the hardship to the [employee] and the likely injury to the public.⁴³

As a result, CNCs are unreasonable if they are “more extensive in duration, geographical area, or type of activity than necessary to protect the employer’s [legitimate] interest.”⁴⁴ Legitimate interests may include protecting valuable and

37. Gomulkiewicz, *supra* note 34, at 260 (“A covenant-not-to-compete forbids a departing employee from competing with a former employer either as an employee of an established rival firm or by starting a new firm.”); *see* Bishara & Starr, *supra* note 23, at 504 (“Covenants not to compete are a post-employment restrictive covenant between an employer and an employee that prohibits the employee from going to work for a competitor or otherwise competing with the former employer.”); *see also* *Covenant Not to Compete*, BLACK’S LAW DICTIONARY (11th ed. 2019) (“A promise, usu. in a sale-of-business, partnership, or employment contract, not to engage in the same type of business for a stated time in the same market as the buyer, partner, or employer.”).

38. *See* Bishara et al., *supra* note 1, at 37 (reporting that fifty-four percent of surveyed CEO contracts contain a CNC that “specifically prohibit entering a consulting agreement with a competitor”).

39. *See Noncompete*, Executive Compensation (CCH) ¶ 415 (2018), 2018 WL 2269228 (“Most non-compete provisions contain fairly standard language that the employee or former employee cannot directly or indirectly own any interest in, operate, control or participate as a partner, director, principal, officer, or agent of . . . any company, person, or entity engaged in a competitive business. However, most non-competes also provide that: ‘Notwithstanding anything herein to the contrary, this Section shall not prevent the Employee from acquiring securities representing up to [1% – 5%] of the outstanding voting securities of any publicly held corporation.’”).

40. *See* Bishara et al., *supra* note 1, at 33 tbl.5, 36 tbl.7 (providing data on geographic and temporal limits on CNCs for CEO employment agreements).

41. *See* Whitmore, *supra* note 24, at 512–14 (discussing activity restraints in CNCs).

42. Gomulkiewicz, *supra* note 34, at 261. *See generally* BRIAN M. MALSBERGER, COVENANTS NOT TO COMPETE: A STATE-BY-STATE SURVEY (11th ed. 2017).

43. RESTATEMENT (SECOND) OF CONTRACTS § 188 (AM. L. INST. 1981).

44. Emily J. Kuo, *The Enforceability Gap of Covenants Not Compete in Telecommuting Employment Relationships*, 1996 U. CHI. LEGAL F. 565, 571 (1996); *see also* RESTATEMENT (SECOND) OF CONTRACTS § 188 cmt. d (“The extent of the restraint is a critical factor in determining its reasonableness. The extent may be limited in three ways: by type of activity, by geographical area, and by time.”); RESTATEMENT OF EMPLOYMENT LAW § 8.06 (AM. L. INST. 2015) (providing that a CNC “is enforceable only if it is reasonably tailored in scope,

confidential business information, customer goodwill, and unique skills or training.⁴⁵ One of the most common rationales for CNCs is “the protection of intellectual property, especially trade secrets.”⁴⁶ Because trade secret protection can be easily lost—for example, by accidental or intentional disclosure by a former employee—courts are often deferential to employer claims that CNCs should be enforced to protect trade secret information.⁴⁷

In contrast, a minority of states, most notably California,⁴⁸ generally refuse to enforce CNCs under the public policy of favoring workers’ freedom of mobility.⁴⁹ The relevant California statute, section 16600 of the Business and Professions Code, states: “Except as provided in this chapter, every contract by which anyone is restrained from engaging in a lawful profession, trade, or business of any kind is to that extent void.”⁵⁰ As a result, the California Supreme Court has held that this law “prohibits employee noncompetition agreements unless the agreement falls within a statutory exception.”⁵¹ Several other states, including Illinois and Oregon, limit CNCs to particular categories of workers.⁵²

Another type of restrictive covenant is a non-solicitation agreement (NSA).⁵³ NSAs prevent departing employees from soliciting business from their

geography, and time to further a protectable interest of the employer,” with certain narrowly delineated exceptions such as employer bad faith or material breach of contract).

45. RESTATEMENT (SECOND) OF CONTRACTS § 188 cmt. b; *see also* RESTATEMENT OF EMPLOYMENT LAW § 8.07 (listing “trade secrets . . . and other protectable confidential information that does not meet the definition of [a] trade secret,” “customer relationships,” “investment in the employee’s reputation in the market,” and the “purchase of a business owned by the employee” as legitimate interests for a CNC).

46. *Gomulkiewicz*, *supra* note 34, at 261; *see also* *Outsource Int’l, Inc. v. Barton*, 192 F.3d 662, 670 (7th Cir. 1999) (Posner, J., dissenting) (“The clearest case for [CNCs] is where the employee’s work gives him access to the employer’s trade secrets.”); *Sandeen & Rowe*, *supra* note 36, at 456 (“[T]he protection of trade secrets has long been considered a legitimate business interest that can justify a[] [CNC].”).

47. *See* *Sandeen & Rowe*, *supra* note 36, at 447 (suggesting that courts are deferential to employers’ assertions that CNCs are necessary to protect their alleged trade secrets, “even though the requirements for trade secret protection have become more exacting since adoption of the Uniform Trade Secrets Act”).

48. Other states that generally refuse to enforce CNCs are North Dakota and Oklahoma. *See* N.D. CENT. CODE § 9-08-06 (2019); OKLA. STAT. tit. 15, § 219A (2021).

49. *See* *Whyte v. Schlage Lock Co.*, 125 Cal. Rptr. 2d 277, 292 (Ct. App. 2002) (“Business and Professions Code section 16600 generally prohibits covenants not to compete, and California public policy strongly favors employee mobility.”); *see also* *Bishara et al.*, *supra* note 1, at 14–15; *Gomulkiewicz*, *supra* note 34, at 264. Some courts have recognized that California law may permit post-employment restraints on competition if it is “necessary to protect the employer’s trade secrets.” *Metro Traffic Control, Inc. v. Shadow Frame Network*, 27 Cal. Rptr. 2d 573, 577 (Ct. App. 1994) (citing *Muggill v. Reuben H. Donnelly Corp.*, 398 P.2d 147, 149 (Cal. 1965)); *see also* *Barnett & Sickleman*, *supra* note 13, at 984 (“Section 16600 does not preclude an employer from preventing a departing employee via injunctive relief from joining a new employer by enforcing nondisclosure, nonsolicitation, or other similar postemployment obligations when doing so promotes the employer’s interest in protecting its trade secrets.”).

50. CAL. BUS. & PROF. CODE § 16600 (West 2021).

51. *Edwards v. Arthur Andersen LLP*, 189 P.3d 285, 288 (Cal. 2008).

52. *See* 820 ILL. COMP. STAT. 90/5 (2017) (prohibiting CNCs for employees who make less than \$13 per hour or the minimum wage under applicable law); OR. REV. STAT. §§ 653.295, 653.020 (2020) (limiting CNCs to certain employees, including individuals who engage in salaried “professional work” and perform “predominantly intellectual, managerial, or creative tasks”).

53. *Bishara et al.*, *supra* note 1, at 7 (describing NSAs as a “subcategory of CNCs”). But NSAs are typically much narrower than CNCs in that they do not prevent most or all competition with the former employer—

former employer's clients and/or attempting to hire their employees for a specific period of time.⁵⁴ The latter type of NSA (prohibiting the solicitation of employees) is sometimes called a non-poaching or non-raiding clause.⁵⁵ Like CNCs, NSAs may be justified based upon the employer's legitimate interests in protecting its goodwill and confidential business or trade secret information, such as customer lists and preferences.⁵⁶ But because NSAs are more limited in scope than CNCs—they prohibit only certain types of post-employment conduct—some states that generally refuse to enforce CNCs may permit NSAs if they further an employer's legitimate interest and are reasonable in scope.⁵⁷

Many employment agreements also contain non-disclosure agreements (NDAs) requiring that employees keep confidential trade secrets and other valuable business information that is not widely known.⁵⁸ NDAs that restrict the

instead, they only prohibit certain types of conduct. In addition, some jurisdictions that largely prohibit CNCs are substantially more permissive of NSAs. *See infra* note 57 and sources cited therein.

54. *See* Bishara et al., *supra* note 1, at 12 (describing NSAs as “related to pursuing clients and recruiting other employees”); Erin E. Gould, Comment, *Read the Fine Print: A Critical Look at Oregon's Noncompete and Nonsolicitation Agreement Laws*, 88 OR. L. REV. 515, 519 (2009) (“[N]onsolicitation agreements . . . prohibit an employee from soliciting business from the employer's customer list, soliciting employment from the employer's current employees, or both.”).

55. *See, e.g.*, *PrecisionIR Inc. v. Clepper*, 693 F. Supp. 2d 286, 289 (S.D.N.Y. 2010) (non-raiding); Greg T. Lembrich, Note, *Garden Leave: A Possible Solution to the Uncertain Enforceability of Restrictive Employment Covenants*, 102 COLUM. L. REV. 2291, 2295 n.16 (2002) (non-poaching).

56. *See* Jerrick Robbins, Comment, *A Solution to Utah's Non-Compete Dilemma: Soliciting the Use of Non-Solicitation Agreements*, 2017 BYU L. REV. 1227, 1254–56 (2017) (contending that NSAs “promote an employer's goodwill by preventing an employee from drawing away the customers and other employees that partially define this goodwill” and may help protect an employer's customer lists).

57. *See, e.g.*, OKLA. STAT. tit. 15, § 219B (2021) (“A contract or contractual provision which prohibits an employee or independent contractor of a person or business from soliciting, directly or indirectly, actively or inactively, the employees or independent contractors of that person or business to become employees or independent contractors of another person or business shall not be construed as a restraint from exercising a lawful profession, trade or business of any kind.”); OR. REV. STAT. § 653.295 (2020) (prohibiting certain types of noncompetition agreements but not nonsolicitation agreements); Gould, *supra* note 54, at 517–18 (“[I]t appears that [section 653.295] applies only to noncompete agreements and does not apply at all to nonsolicitation agreements, leaving nonsolicitation agreements free from any statutory restrictions.”); *see also* Michael Selmi, *Trending and the Restatement of Employment Law's Provisions on Employee Mobility*, 100 CORNELL L. REV. 1369, 1381 (2015) (noting that NSAs “had traditionally been scrutinized lightly” compared to CNCs “because they were a lesser form of restraint”).

The case law in California is muddled regarding the enforceability of NSAs. Some older lower court decisions indicated that California statutory law prohibiting contractual restraints on employment “does not invalidate an employee's agreement . . . not to solicit [the former employer's] customers.” *Loral Corp. v. Moyes*, 219 Cal. Rptr. 836, 841 (Ct. App. 1985); *accord* *Webb v. W. Side Dist. Hosp.*, 193 Cal. Rptr. 80, 84–85 (Ct. App. 1983) (upholding an arbitration decision enforcing a no-hire clause). But in 2008, the California Supreme Court struck down a one-year NSA that prohibited the defendant from soliciting his former employer's customers, holding that it was “invalid because it restrained [the employee's] ability to practice his profession.” *Edwards v. Arthur Andersen LLP*, 189 P.3d 285, 292 (Cal. 2008). More recently, several federal and state court decisions in California have called *Loral* into question, holding that it is no longer good law in light of *Edwards*. *See, e.g.*, *WeRide Corp. v. Huang*, 379 F. Supp. 3d 834, 852 (N.D. Cal. 2019); *Conversion Logic, Inc. v. Measured, Inc.*, No. 219CV05546ODWFFMX, 2019 WL 6828283, at *3–4 (N.D. Cal. Dec. 13, 2019); *Barker v. Insight Global, LLC*, No. 16-CV-07186-BLF, 2019 WL 176260, at *2–3 (N.D. Cal. Jan. 11, 2019); *AMN Healthcare, Inc. v. Aya Healthcare Servs., Inc.*, 239 Cal. Rptr. 3d 577, 587–90 (Ct. App. 2018).

58. Bishara et al., *supra* note 1, at 3; *see also id.* at 42 (finding nearly all CEO employment agreements studied contained an NDA).

use and transfer of knowledge in a business context are potentially anticompetitive.⁵⁹ However, unlike CNCs, “a standalone NDA does not necessarily restrict an employee’s mobility options” because “[t]he employee can still move to a competitor.”⁶⁰ NDAs are widely used and permissible, even in states like California where CNCs are generally not enforced.⁶¹

B. THEORETICAL VIEWS REGARDING NONCOMPETES

Traditional economic theory views CNCs and other contractual post-employment restrictions on competition as important legal tools for the development of human capital.⁶² Firms can increase their productivity—and thus their profitability—by investing in training of their workforce.⁶³ This may involve general training of transferrable skills, specific training that is most valuable to the current employer, or both.⁶⁴ Absent a CNC, however, “an incentive for opportunistic behavior is created” once a worker receives this training, “either by going to work for himself or by going to work for another firm, which will pay him a premium because of the value of his training.”⁶⁵ As a result, “employers would underinvest in research, development, and employee training”—particularly “general training” that is readily transferrable to a new position—without post-employment restraints like CNCs.⁶⁶

Second, under the traditional view, CNCs are justifiable as an effective method for firms to protect against the intentional or accidental disclosure of confidential business information, including trade secrets, to their competitors.⁶⁷ Even though employers can (and often do) contractually require their employees not to disclose trade secret information after termination through an NDA, this may prove insufficient, as a former employee may be unable to ignore the

59. *Id.* at 7.

60. *Id.* at 20.

61. *Id.* at 21.

62. See generally Blake, *supra* note 12; Kitch, *supra* note 12; Rubin & Shedd, *supra* note 12; see also Mark A. Glick, Darren Bush & Jonathan Q. Hafen, *The Law and Economics of Post-Employment Covenants: A Unified Framework*, 11 GEO. MASON L. REV. 357 (2002).

63. See Samila & Sorensen, *supra* note 19, at 425 (“Companies can increase their productivity by training workers, developing new products and processes, and building relationships with customers and suppliers.”); see also Eric Garton, *The Case for Investing More in People*, HARV. BUS. REV. (Sept. 4, 2017), <https://hbr.org/2017/09/the-case-for-investing-more-in-people>.

64. GARY S. BECKER, HUMAN CAPITAL: A THEORETICAL AND EMPIRICAL ANALYSIS WITH SPECIAL REFERENCE TO EDUCATION 11–18 (1964).

65. Rubin & Shedd, *supra* note 12, at 97; see also Blake, *supra* note 12, at 652 (explaining that absent post-employment restraints on competition, an employer “cannot be sure” that an employee it has trained “will stay on so that [its] investment will be rewarded, since contracts for personal services are not usually specifically enforced”).

66. On Amir & Orly Lobel, *Driving Performance: A Growth Theory of Noncompete Law*, 16 STAN. TECH. L. REV. 833, 837 (2013); see also Blake, *supra* note 12, at 652 (“Unless some enforceable commitment or effective deterrent is possible, employers will not be justified in making the optimum outlay on employee-training programs . . .”).

67. Blake, *supra* note 12, at 667–74; see also Moffat, *supra* note 1, at 900 (“It is often asserted that noncompetes are necessary for the protection of trade secrets Noncompete agreements regularly cite trade secrets or confidential information as the ‘protectable interest’ sought to be guarded with the contract.”).

information learned in their previous job while working for a competitor.⁶⁸ Moreover, a *post hoc* breach of contract claim against a former employee for violating an NDA may be ineffective at undoing the harm caused.⁶⁹ Consequently, “[t]he most effective protective device” for trade secrets and other proprietary business information “is an enforceable covenant not to compete.”⁷⁰

More recently, however, numerous legal and economics scholars have forcefully challenged the traditional view regarding the normative desirability of CNCs.⁷¹ First, they contend that CNCs negatively impact the mobility of skilled labor, which adversely affects employee productivity and economic efficiency.⁷² By definition, CNCs constrain employees’ freedom to work, temporarily precluding them from taking another position in the same field as their former employer. This effectively sidelines highly educated and valuable workers, wasting their time, atrophying their skills, and potentially degrading their professional networks.⁷³ Even if it is unclear whether the CNC would apply, the *in terrorem* effect of a potential lawsuit may cause the former employee to refrain from seeking new employment during the CNC.⁷⁴ At the same time, an employee subject to a CNC may be less attractive on the job market, as the risk of litigation may deter a prospective new employer—

68. See Blake, *supra* note 12, at 669–70 (“Even in the best of good faith, a former technical or ‘creative’ employee working for a competitor . . . can hardly prevent his knowledge of his former employer’s confidential methods or data from showing up in his work.”).

69. See *id.* at 669 (“[T]he important thing to the employer is not having a cause of action in case of a breach of confidence, but preventing the violation from occurring. An injunction not to disclose can seldom undo or effectively prevent the doing of the real damage.”).

70. *Id.* at 670.

71. See generally LOBEL, *supra* note 16; Amir & Lobel, *supra* note 66; Norman D. Bishara, *Covenants Not to Compete in a Knowledge Economy: Balancing Innovation from Employee Mobility Against Legal Protection for Human Capital Investment*, 27 BERKELEY J. EMP. & LAB. L. 287 (2006); Mark J. Garmaise, *Ties That Truly Bind: Noncompetition Agreements, Executive Compensation, and Firm Investment*, 27 J.L. ECON. & ORG. 376 (2009); Gilson, *supra* note 15; Marx, *The Michigan Non-Compete Experiment*, *supra* note 19; Moffat, *supra* note 1; Moffat, *supra* note 17; Samila & Sorensen, *supra* note 19. But see Barnett & Sichelman, *supra* note 13, at 975–78 (responding to some of these arguments); Jonathan M. Barnett & Ted Sichelman, *Revisiting Labor Mobility in Innovation Markets* 12–29 (USC Gould Sch. of L. Ctr. for L. & Soc. Sci., Research Paper Series No. CLASS16-13, 2016), <https://perma.cc/V2T9-6UGC> (critiquing some of the most widely-cited empirical studies that contend noncompetes reduce labor mobility).

72. See Blake, *supra* note 12, at 650 (“Anything that impedes an employee’s freedom of access to a job in which [the employee’s] productivity . . . would be higher, involves a cost in terms of the economy’s welfare.”).

73. See Garmaise, *supra* note 71; Charles Tait Graves & James A. DiBoise, *Do Strict Trade Secret and Non-Competition Laws Obstruct Innovation?*, 1 ENTREPRENEURIAL BUS. L.J. 323, 331 (2006) (“An inventive employee . . . wants to start a new company But his employer included a boilerplate non-competition covenant in his employment contract, and he is sidelined for a year from any activity that his employer might deem competitive. He must instead pursue a business less suited to his talents, or in which he has less experience. Waiting for one year means a wasted period, and few, if any, employees have the means to do nothing for a year before launching a competitive business.”); see also *Marsh USA Inc. v. Cook*, 354 S.W.3d 764, 780–81 (Tex. 2011) (Willett, J., concurring) (“Economic dynamism in the 21st century requires speed, knowledge, and innovation—imperatives that must inform judicial review of efforts to sideline skilled talent. Courts must critically examine noncompetes in light of our contemporary, knowledge-based economy that prizes ingenuity and intellectual talent.”) (footnote omitted).

74. Moffat, *supra* note 1, at 888.

especially if the former employer is a deep-pocketed incumbent in the same industry.⁷⁵ Thus, by limiting mobility, CNCs can “reduce the average quality of matches between employees and employers,” adversely impacting “the productivity of companies.”⁷⁶ As a result, critics of CNCs argue they can harm both employees and their prospective new employers.

Second, CNCs may depress employees’ wages. A noncompete “has an inevitable tendency to reduce an employee’s . . . bargaining power during his employment,” as the employee cannot freely switch positions,⁷⁷ thus diminishing the threat that the employee will depart for higher wages elsewhere.⁷⁸ Indeed, CNCs are often the product of a preexisting disparity in bargaining power. “[A]s a general matter, employers have vastly more power in the negotiation and performance of the employment relationship. This asymmetry heavily influences the existence and character of [CNCs].”⁷⁹ As Viva Moffat has noted, CNCs “are rarely negotiated and, indeed, are often entered into well after the employment relationship has begun,” when the employee’s bargaining power is low.⁸⁰ And as previously mentioned, the threat of CNCs may require employees to take “occupational detours” to avoid potential litigation, which can harm their lifetime earnings.⁸¹

Third, CNCs may impede entrepreneurship and adversely affect innovation. By limiting labor mobility, CNCs can hinder employees from leaving their former employers to launch a new firm. This may occur directly by preventing a startup from competing against its founders’ previous employer(s), as well as indirectly by making it more difficult for a startup to hire an experienced workforce.⁸² In addition, CNCs interfere with the flow of information that occurs when employees change firms.⁸³ Scholars who favor

75. See Matt Marx & Lee Fleming, *Non-Compete Agreements: Barriers to Entry . . . and Exit?*, 12 INNOVATION POL’Y & ECON. 39, 52 (2012) (“[N]on-competes may favor large firms over small ones because of the asymmetric costs of the legal system.”).

76. Samila & Sorensen, *supra* note 19, at 428.

77. Blake, *supra* note 12, at 648.

78. See Russell Korobkin, *Bargaining Power as Threat of Impasse*, 87 MARQ. L. REV. 867, 869 (2004) (discussing the role of competing job offers in bargaining using negotiation theory).

79. Moffat, *supra* note 1, at 885 (footnote omitted).

80. *Id.* at 884. However, some states require additional consideration—such as a promotion or raise—to support a noncompete entered into during employment. See, e.g., *Socko v. Mid-Atl. Sys. of CPA, Inc.*, 126 A.3d 1266, 1274–75 (Pa. 2015); *Charles T. Creench, Inc. v. Brown*, 433 S.W.3d 345, 351–54 (Ky. 2014). *But see Runzkeimer Int’l, Ltd. v. Friedlen*, 862 N.W.2d 879, 890–92 (Wis. 2015) (holding that continued employment is sufficient consideration to support a noncompete entered into during employment).

81. See Matt Marx, *Good Work if You Can Get It . . . Again: Non-Compete Agreements, “Occupational Detours,” and Attainment* (July 21, 2017) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1456748 (finding, based on field data from interviews and a survey, that individuals seek to avoid violating post-employment restraints by taking “occupational detours”).

82. Samila & Sorensen, *supra* note 19, at 428.

83. Gomulkiewicz, *supra* note 34, at 253–54; see also Bishara, *supra* note 71, at 306 (“[K]nowledge transfer from departing employees to other firms is, by design, inhibited by covenant not to compete enforcement. Knowledge spillover is thus less likely to happen in that manner because when employees are mobile and move to other firms they take tacit information with them, but by definition noncompetes limit mobility.” (footnote omitted)).

limiting CNCs contend that these “information spillovers” play an important role in stimulating innovation, particularly in high-technology industries.⁸⁴

Fourth, some scholars have highlighted the negative impact of CNCs on workers’ autonomy and dignitary interests. As Harlan Blake explained in his seminal 1960 article on noncompetes, “[e]very postemployment restraint, for whatever reason imposed, has inevitable effects which in some degree oppose commonly shared values. In view of our feeling that a man should not be able to barter away his personal freedom, even this small degree of servitude is distasteful.”⁸⁵ Although these concerns are not prominent in the economic literature, some have argued that employees’ autonomy and freedom should be more strongly considered in the normative debate regarding CNCs.⁸⁶

C. EXISTING EMPIRICAL RESEARCH ON NONCOMPETES

This Subpart summarizes the methodology and results from a number of empirical studies of CNCs and other post-employment restrictive covenants. It is not intended to provide a complete report of all empirical research in this field,⁸⁷ but instead to highlight the most relevant studies conducted to date, their key findings, and some of their limitations.⁸⁸

84. LOBEL, *supra* note 16, at 39–40, 95–97; Amir & Lobel, *supra* note 66, at 856–61; Gilson, *supra* note 15, at 579, 603–08.

85. Blake, *supra* note 12, at 650.

86. See Moffat, *supra* note 17, at 911 (“While the discussion of the efficiency implications is quite robust in the literature, the personal autonomy and dignitary concerns are often treated in . . . parenthetical fashion.”).

87. Most notably, it does not include empirical studies in the economic and business literature that focus on the impact of differential enforcement of CNCs between states on numerous issues, including entrepreneurship, employee mobility, firm performance, capital investment, and employee training and wages. For a more detailed summary of this scholarship, see *generally* Bishara & Starr, *supra* note 23, at 523–34.

88. For a comprehensive list of the existing empirical literature regarding CNCs through 2016, see *generally* Bishara & Starr, *supra* note 23 (identifying twenty-four empirical studies). Empirical studies that at least partially involve CNCs that postdate the Bishara & Starr article include: Daniel Aobdia, *Employee Mobility, Noncompete Agreements, Product-Market Competition, and Company Disclosure*, 23 REV. ACCOUNTING STUD. 296 (2018); Thor Berger & Carl Benedikt Frey, *Regional Technological Dynamism and Noncompete Clauses: Evidence from a Natural Experiment*, 57 J. REG’L SCI. 655 (2017); Sarath Sanga, *Incomplete Contracts: An Empirical Approach*, 34 J.L. ECON. & ORG. 650 (2018); David P. Twomey, *The Developing Law of Employee Non-Competition Agreements: Correcting Abuses; Making Adjustment to Enhance Economic Growth*, 50 BUS. L. REV. 87 (2017); Desheng Yin, Iftekhar Hasan, Nada Kobeissi & Haizhi Wang, *Enforceability of Noncompetition Agreements and Firm Innovation: Does State Regulation Matter?*, 19 INNOVATION: MGMT., POL’Y & PRAC. 270 (2017); Smriti Anand, Iftekhar Hasan, Priyanka Sharma & Haizhi Wang, *Enforceability of Non-Complete Agreements: When Does State Stifle Productivity?* (Bank of Fin. Rsch., Discussion Paper No. 24/2017, 2017) <https://ssrn.com/abstract=3022475>; Jessica S. Jeffers, *The Impact of Restricting Labor Mobility on Corporate Investment and Entrepreneurship* (Dec. 2019) (unpublished manuscript), https://papers.ssrn.com/abstract_id=3040393; Omesh Kini, Ryan Williams & Sirui Yin, *CEO Noncompete Agreements, Job Risk, and Compensation*, REV. FIN. STUD. (forthcoming 2021); Michael Lipsitz, *The Costs and Benefits of Noncompete Agreements* (2017) (Ph.D. dissertation, Boston University), <https://hdl.handle.net/2144/27309>; Starr et al., *supra* note 2; Evan Starr, Justin Frake & Rajshree Agarwal, *Mobility Constraint Externalities*, 30 ORG. SCI. 961 (2019).

1. *Litigation Studies*

Two early empirical studies relied on reported appellate court decisions regarding CNCs. In 1990, Peter J. Whitmore reviewed a sample of 105 court opinions from the years 1966–1968 and 1986–1988, representing past and then-present judicial enforcement of CNCs, respectively,⁸⁹ and then handed coded these cases for over thirty potential factors that may influence judicial decision-making.⁹⁰ Descriptively, Whitmore's study reported courts enforced CNCs slightly over half of the time in both decades,⁹¹ but that the duration (time length) of enforceable CNCs decreased over time.⁹² Specifically, Whitmore found that nearly all (94%) of CNCs contained some form of time restriction, but the average length of enforced CNCs was 21 months in the 1980s, compared to 27 months in the 1960s.⁹³ In addition, Whitmore found that nearly all (94%) CNCs contained some geographic and/or activity restraint,⁹⁴ but that the number of CNCs containing a geographic limitation decreased over time,⁹⁵ while the frequency of activity limitations had increased.⁹⁶ Whitmore also found that courts were much more likely to enforce CNCs over both time periods when the employee had access to and/or used confidential customers lists or trade secrets in his or her subsequent employment.⁹⁷

A decade later, Helen LaVan randomly sampled 104 litigated cases in federal and state court involving noncompete agreements litigated in the 1980s and 1990s.⁹⁸ From this group of cases, LaVan found that CNCs involved managers 25% of the time, sales personnel 31% of the time, and other professionals 37% of the time.⁹⁹ Nearly a quarter (23.7%) of the sampled CNC cases involved trade secrets, with 14.2% also involving confidential business

89. Whitmore, *supra* note 24, at 494 n.67; *see also id.* app. A, at 528–32 (listing sampled cases).

90. *Id.* at 494–95; *see also id.* app. B, at 533 (listing variables).

91. *Id.* at 499 tbl.1 (reporting an overall enforcement rate of 58% for the 1960s cases and 55% for the 1980s).

92. *Id.* at 500–01.

93. *Id.* at 501. It is unclear why Whitmore's study reported mean (average) duration of CNCs rather than the median; the median is typically preferred as a descriptive statistic because it is more resistant to outliers.

94. *Id.*

95. *See id.* at 509 tbl.7 (reporting that 45% of CNCs in the decisions from the 1960s contained a geographic limitation compared to 26% of CNCs in the decisions from the 1980s). The study also found that the average mileage restriction in CNCs decreased between the 1960s and 1980s as well. *See id.* at 511 tbl.9 (finding that the average geographic restriction of CNCs was 70.6 miles in the decisions from the 1960s versus 45.0 miles in the decisions from the 1980s).

96. *See id.* at 509 tbl.7 (reporting that 39% of CNCs in the 1960s contained an activity limitation compared to 50% in the 1980s).

97. *Id.* at 503 tbl.2, 508 tbls.5 & 6.

98. Helen LaVan, *A Logit Model to Predict the Enforceability of Noncompete Agreements*, 12 EMP. RESP. & RTS. J. 219, 225 (2000). Although not entirely clear from the article, it appears that this random sample was drawn from a larger pool of 411 court opinions cited, discussed, or reported in Volumes 1–14 (1985 to 1998) of the Bureau of National Affairs (BNA) looseleaf publication *Individual Employee Rights Manual*. *See id.* at 219, 225, 234. Approximately 30% of these cases were in federal court (both district and appellate), and the remaining amount (70%) were in state court. *Id.* at 227 tbl.II.

99. *Id.* at 227 tbl.II. Another 1% were classified as CNCs involving entertainers. *Id.*

information.¹⁰⁰ This study also reported that in slightly over half of the cases (54.5%), courts found the CNC's geographic limitation to be reasonable, although it did not specify what these limitations were.¹⁰¹ Similarly, LaVan reported that courts found activity restrictions in nearly two-thirds of the sampled CNCs (63.7%) to be reasonable, but the article did not describe the scope of these restrictions.¹⁰²

2. *Studies of Specific Types of Employees*

A number of empirical studies have examined CNCs covering specific types of employees. Several of these have looked at employment agreements of high-ranking corporate executives of publicly-traded companies, whose contracts are publicly available in SEC filings.¹⁰³ In a 2006 article, Stewart Schwab and Randall Thomas examined a sample of 375 employment contracts for Chief Executive Officers (CEOs) at the 1500 largest public corporations, including whether these contracts included CNCs.¹⁰⁴ They found that about two-thirds (67.5%) of sampled CEO employment contracts contained CNCs, most of which were either for one (21.33%) or two (31.47%) years in length.¹⁰⁵

In another study, Mark Garmaise looked at a random sample of SEC filings for 500 large, publicly traded firms from between 1992 and 2004, finding evidence that over 70% of these firms had CNCs with their top executives.¹⁰⁶ Somewhat surprisingly, this study also found that a majority (58%) of California firms in the sample reported using CNCs,¹⁰⁷ even though these agreements are usually unenforceable under California law.¹⁰⁸ Garmaise also developed a 12-factor scale to assess the strength of state enforcement of noncompetes (the "non-competition enforcement index").¹⁰⁹ Based on this scale, Garmaise found that increased state enforcement of CNCs "reduces executive mobility" and "results in lower executive compensation."¹¹⁰

In perhaps the most detailed study of actual employment agreements containing post-employment restraints to date, Norman Bishara, Kenneth Martin, and Randall Thomas analyzed CEO employment contracts for a random sample 500 S&P 1500 companies between 1996 and 2010.¹¹¹ They then hand

100. *Id.*

101. *Id.*

102. *Id.*

103. See Bishara et al., *supra* note 1, at 3 ("[P]ublic companies must disclose their CEOs' employment contracts.>").

104. Stewart J. Schwab & Randall S. Thomas, *An Empirical Analysis of CEO Employment Contracts: What Do Top Executives Bargain For?*, 63 WASH. & LEE L. REV. 231, 232–34 (2006).

105. *Id.* at 254–55, 255 tbl.9.

106. Garmaise, *supra* note 71, at 388, 396.

107. *Id.* at 396.

108. See *supra* notes 48–51 and accompanying text.

109. Garmaise, *supra* note 71, app. A.6. Barnett and Sichelman have critiqued Garmaise's non-competition enforcement index as problematic for several reasons. See Barnett & Sichelman, *supra* note 13, at 1010–17.

110. Garmaise, *supra* note 71, at 376–79.

111. Bishara et al., *supra* note 1, at 3.

coded each CEO employment agreement (874 in total) for a wide variety of information, including the frequency, scope, and duration of CNCs, NSAs, and NDAs in these contracts.¹¹² Bishara et al. report that over 70% of CEO contracts in their sample contained post-employment CNCs,¹¹³ but that CNCs were less frequently used if the firm's primary location was in California.¹¹⁴ Examining CNCs in more detail, they found that a majority of CEOs' CNCs lasted two years or less after their employment ended,¹¹⁵ and that the geographic scope of these CNCs was quite broad—they most commonly applied either anywhere the employer operated or did business (38.3%) or had no express geographic limit (41.8%).¹¹⁶ In addition, three-quarters (75.6%) of these agreements contained NSAs prohibiting CEOs from soliciting employees of their former firm, and a slight majority (50.8%) prohibited CEOs from soliciting customers of their former firm.¹¹⁷ Finally, the vast majority of CEO contracts (87.1%) contained an NDA, and nearly all contracts that had a CNC also had an NDA (93.4%).¹¹⁸

Two other studies dealt with surveys of other groups of high-skill groups of workers. In conjunction with the Institute of Electrical and Electronics Engineers (IEEE), Matt Marx surveyed over 1000 engineers across a variety of industries.¹¹⁹ Almost half of respondents (46.8%) indicated that they had been asked by an employer to sign a CNC; of these, nearly all (92.6%) agreed to do so.¹²⁰ In addition, Marx reported that over three-quarters (77.14%) of engineers who signed a CNC did so on or before their first day of employment with the firm.¹²¹

In a recent paper, Kurt Lavetti, Carol Simon, and William D. White surveyed nearly 2000 primary care physicians in five states.¹²² They found that nearly half (45%) of primary care physicians in group practices are bound by CNCs.¹²³ The percentage of physicians covered by state varied significantly,

112. *See id.* at 24–27 (describing the study's methodology).

113. *Id.* at 29 tbl.3.

114. *See id.* at 34 tbl.6 (finding that CNCs were found in 84% of CEO contracts where the firm's primary location was outside of California, compared to 62.4% where the firm's primary location was inside California, and that this difference is statistically significant).

115. *See id.* at 36–37, 36 tbl.7 (reporting that 32.8% of CEOs had a CNC of one year or less, and another 31.8% had a CNC greater than one year but no more than two years; 7% were for greater than two years; and the remaining 28.5% did not specify a length or had another triggering event for the CNC's termination).

116. *See id.* at 41 tbl.9 (reporting also that another 5.3% of CNCs expressly applied worldwide, while 10.2% covered only the entire United States and another 4.3% covered only part of the United States).

117. *Id.* at 38.

118. *Id.* at 42.

119. Matt Marx, *The Firm Strikes Back: Non-Compete Agreements and the Mobility of Technical Professionals*, 76 AM. SOCIO. REV. 695, 701–02 (2011). The survey was sent to 5000 randomly-selected IEEE members, with a response rate of 20.6% (1029 surveys). *Id.* at 702.

120. *Id.* at 702 tbl.1.

121. *Id.* at 706 tbl.4.

122. Lavetti et al., *supra* note 24. The survey in question is the Physician Perspectives on Patient Care Survey, which the authors conducted in 2007. *Id.* at 1040. The states where primary care physicians were surveyed are: California, Georgia, Illinois, Pennsylvania, and Texas. *Id.*

123. *Id.* at 1030.

from a low of 31.3% in California to a high of 60.6% in Pennsylvania.¹²⁴ The former figure is interesting in light of the fact that CNCs are generally unenforceable in California.¹²⁵ In addition, primary care physicians who worked at group practices of more than a handful of doctors were more likely to be covered by CNCs.¹²⁶ Group practices that used CNCs were more likely to generate greater revenue per physician and spend more hours on patient care per week.¹²⁷ Finally, Lavetti et al. found that physicians covered by CNCs had longer tenures with a practice group, and thus were less likely to change positions, compared to those without CNCs.¹²⁸

3. *Online Surveys*

A recent large-scale online survey of American workers provides additional information regarding the frequency and scope of CNCs and other post-employment restraints on competition. In a forthcoming article, Evan Starr, J.J. Prescott, and Norman Bishara report the results of a survey of labor force participants age 18 to 75 who reported working in the private sector (for profit or non-profit organizations) or were an employee of a public healthcare system.¹²⁹ After inviting over 700,000 participants, the authors conducted an extensive audit of completed survey responses to filter out potentially duplicative and unreliable surveys, resulting in a final sample of 11,505 respondents.¹³⁰ From these responses, they found an estimated 18% of workers were bound by a CNC.¹³¹ Consistent with expectations, CNCs were more frequent among well-educated workers¹³² and highly-compensated employees,¹³³ but approximately a third (35%) of respondents who lacked an undergraduate (bachelor's) degree reported being covered by a CNC at some point in the past, as well as a third (33%) of workers who made under \$40,000 per year.¹³⁴ Similarly, CNCs were more common in certain highly-skilled

124. *Id.* at 1042 tbl.1.

125. *See supra* notes 48–51 and accompanying text.

126. Specifically, practices with 2–3 physicians used CNCs less than a third of the time (31.3%), while practices of 4–499 physicians used CNCs between 45–50% of the time. Lavetti et al., *supra* note 24, at 1056 tbl.8.

127. *See id.* at 1057 tbl.9.

128. *Id.* at 1058–61.

129. Starr et al., *supra* note 2, at 3.

130. *Id.* at 3–4; *see also* Prescott et al., *supra* note 23, at 406–55 (describing authors' methodology in detail).

131. Starr et al., *supra* note 2, at 5. Another recent survey of employers concluded that between 27.8% and 46.5% of private sector workers are subject to a noncompete. Alexander J.S. Colvin & Heidi Shierholz, *Noncompete Agreements: Ubiquitous, Harmful to Wages and to Competition, and Part of a Growing Trend of Employers Requiring Workers to Sign Away Their Rights*, ECON. POL'Y INST. (Dec. 10, 2019), <https://www.epi.org/publication/noncompete-agreements>.

132. *See* Starr et al., *supra* note 2, at 6, 22 fig.3 (reporting that 25% of surveyed persons with a bachelor's degree and 39% of persons with a professional degree were currently subject to a CNC, compared to under 15% for high school graduates and persons with less than two years of college).

133. *Id.* at 6, 22 fig.4 (reporting that at least 32% of surveyed persons making in excess of \$100,000 per year were currently subject to a CNC, compared to 15% or less for those making less than \$40,000).

134. *Id.* at 6.

occupations such as engineering, computer science, and management.¹³⁵ Persons who worked with trade secret information were significantly more likely to be bound by a CNCs.¹³⁶ In another paper based upon the same survey data, the authors find that CNCs are also associated with decreased labor mobility.¹³⁷

In a recent policy paper, Alan Krueger and Eric Posner reported the results of an online survey of 795 employees.¹³⁸ Based on a weighted sample, they found that 15.5% of workers were currently covered by a CNC. They also found that higher-income workers were more likely to be subject to a CNC.¹³⁹ But in contrast to Starr et al., Krueger and Posner found that the percentage of workers bound by a CNC was slightly higher for those with a high school degree or less than for workers with at least some college education.¹⁴⁰

4. *Experimental Studies*

A number of experimental studies have also attempted to assess the impact of CNCs on employee mobility and performance. Some of these studies involve interactions with voluntary participants in a controlled environment, while another cluster of articles has studied the impact of a single state's apparently accidental change regarding the enforceability of CNCs.

In one frequently-cited study, Matt Marx, Deborah Strumsky, and Lee Fleming exploited a "natural experiment"¹⁴¹ involving Michigan's Antitrust Reform Act, which the authors asserted inadvertently repealed the state's statutory bar on enforcing noncompete agreements.¹⁴² Using a difference-in-

135. *Id.* at 7, 23 fig.5.

136. *Id.* at 7, 25 fig.7.

137. See Evan Starr, J.J. Prescott & Norman Bishara, *The Behavioral Effects of (Unenforceable) Contracts*, J.L. ECON. & ORG. (forthcoming) (manuscript at 34–35), https://papers.ssrn.com/abstract_id=2858637.

138. ALAN B. KRUEGER & ERIC A. POSNER, HAMILTON PROJECT, A PROPOSAL FOR PROTECTING LOW-INCOME WORKERS FROM MONOPSONY AND COLLUSION 7–8 (2018), https://www.hamiltonproject.org/assets/files/protecting_low_income_workers_from_monopsony_collusion_krueger_posner_pp.pdf.

139. *Id.* at 8.

140. See *id.* (reporting that 17.5% of workers with a high school education or less were bound by CNCs, compared to 14.6% for those who had at least some college education).

141. A natural experiment in economics is a "serendipitous situation in which persons are assigned randomly to a treatment (or multiple treatments) and a control group, and outcomes are analysed for the purposes" of testing a hypothesis. J. DiNardo, *Natural Experiments and Quasi-Natural Experiments*, in 5 THE NEW PALGRAVE DICTIONARY OF ECONOMICS 9235, 9325–26 (3d ed. 2018). See generally THAD DUNNING, *NATURAL EXPERIMENTS IN THE SOCIAL SCIENCES: A DESIGN-BASED APPROACH* (2012) (providing an overview of the topic).

142. See Marx et al., *The Michigan Non-Compete Experiment*, *supra* note 19, at 877 (citing Act 274, Michigan Antitrust Reform Act of 1984 (codified at MICH. COMP. LAWS §§ 445.771–445.788 (2021))). The Michigan Antitrust Reform Act (MARA) was based on the Uniform State Antitrust Act promulgated by the National Conference of Commissioners of Uniform State Laws. See 2 ROCKY C. TSAI & KATHLEEN W. BRADISH, *STATE ANTITRUST PRACTICE & STATUTES* (5th ed. 2014). However, in enacting MARA, the Michigan legislature repealed MICH. COMP. LAWS § 445.761 (enacted in 1905), which provided that "[a]ll agreements and contracts by which any person . . . agrees not to engage in any avocation or employment . . . are hereby declared to be against public policy and illegal and void." Marx et al., *The Michigan Non-Compete Experiment*, *supra* note 19, at 877 (omissions in original). Based on the lack of contemporaneous commentary in the legislative history and law journal articles shortly after MARA's passage, Marx et al. conclude that MARA "inadvertently repealed" this statutory ban on enforcing CNCs. *Id.*

differences approach, they compared the job mobility of patented inventors in Michigan before and after this change with inventors in ten other states that did not enforce CNCs.¹⁴³ Marx et al. found that the intra-state job mobility of inventors in Michigan fell 8.1% once CNCs became enforceable,¹⁴⁴ with highly-skilled inventors in Michigan suffering an even greater decline of 16.2%.¹⁴⁵ In a follow-up study, Marx, Fleming, and Jasjit Singh found that the rate of interstate emigration of patented inventors in Michigan grew faster compared to other non-enforcing states in the decade following Michigan's legislative change,¹⁴⁶ leading the authors to conclude that CNCs "encourage the migration of [highly skilled] workers from states where such contracts are enforceable to states where they are not."¹⁴⁷

However, Jonathan Barnett and Ted Sichelman have critiqued numerous aspects of the Marx et al. studies, including the incompleteness of the patent record for tracking inventor mobility, the selection of other (control) states as non-enforcing jurisdictions for CNCs, and the failure to control for the inclusion of a "savings clause" in Michigan's antitrust legislation which provided that pre-existing CNCs remained enforceable after its enactment.¹⁴⁸ Further muddying the waters is a recent paper that employed a similar difference-in-differences methodology involving Michigan and found that enforcement of CNCs "had a positive and significant effect on the startup job creation rate" and "little to no effect on the entry rate of new firms."¹⁴⁹

Experimental studies also have reached mixed results regarding the impact of CNCs on employees' motivation and work performance. In a 2013 study, On Amir and Orly Lobel assessed the effects of postemployment restrictions on task performance by conducting an online experiment involving over 1000 subjects.¹⁵⁰ Participants were randomly assigned different types of work

143. Marx et al., *The Michigan Non-Compete Experiment*, *supra* note 19, at 879–82. In particular, Marx et al. used matching algorithms for inventors in the National Bureau of Economic Research (NBER) patent file, which contained data on all U.S. patents issued from 1975 to 2000, supplemented by additional data collected by the authors. *Id.* at 879 (citing Bronwyn H. Hall, Adam B. Jaffe & Manuel Trajtenberg, *The NBER Patent Citations Data File: Lessons, Insights and Methodological Tools* (Nat'l Bureau of Econ. Rsch., Working Paper No. 8498, 2001)).

144. *Id.* at 884–86. This figure excluded Michigan inventors who worked for automobile firms. *Id.* at 887.

145. Marx et al. defined highly-skilled inventors as those that were one standard deviation above the mean in terms of patenting. *Id.* at 886.

146. See Marx et al., *Regional Disadvantage?*, *supra* note 19, at 397, 399 tbl.2 (finding that the rate of emigration of patented inventors in Michigan grew from 0.24% in 1975–1984 to 0.32% from 1985–1996, compared to patented inventors in the control group of states that did not enforce noncompetes, which decreased from 0.20% to 0.13% during these time periods).

147. *Id.* at 403.

148. See Barnett & Sichelman, *supra* note 13, at 1017–18, 1020–23; Barnett & Sichelman, *supra* note 71, at 73–83.

149. See Gerald Carlino, *Do Non-Compete Covenants Influence State Startup Activity? Evidence from the Michigan Experiment* (Fed. Rsv. Bank of Phila., Working Paper No. 17-30, 2017), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3041843.

150. Amir & Lobel, *supra* note 66, at 837. These subjects were intended to simulate a high-skilled marketplace—99% had an undergraduate degree, while 43% also had a graduate degree. *Id.* at 852.

assignments requiring either pure effort or more creative production.¹⁵¹ In addition, each participant was randomly assigned one of three conditions: an absolute noncompete that would preclude the subject from completing the same kind of task in future assignments; a partial noncompete where an employee could opt out of the restriction against similar work by paying back the training costs to the employer; and no contractual restriction.¹⁵² The results from this experiment found that subjects with a CNC had a higher rate of failing to complete the assigned work.¹⁵³ In addition, participants with a CNC were twice as likely to make mistakes in the effort-based task.¹⁵⁴ Based on these results, Amir and Lobel contend that “certain postemployment contractual restrictions may negatively impact motivation and performance” and “discourage employees to invest in their work performance.”¹⁵⁵

In a 2016 article, Guido Buenstorf, Christoph Engel, Sven Fisher, and Werner Gueth reported the results of an experiment intended to simulate a principal-agent relationship subject to different noncompete restrictions.¹⁵⁶ Two of the conditions involved a CNC, while a third (baseline) condition lacked any restraint.¹⁵⁷ The study participants were 256 university students.¹⁵⁸ Contrary to the authors’ hypotheses, the results of the experiment showed that “imposing a non-compete clause has no significant effect on effort.”¹⁵⁹ From this, Buenstorf et al. concluded that “our experimental results do not suggest that adverse effects” on employee motivation from CNCs “are a substantial concern” in most cases.¹⁶⁰

5. *Key Findings and Limitations of Prior Studies*

Several inferences may be drawn regarding the frequency, scope, and potential impact of CNCs from the existing body of empirical research. First, it appears that CNCs are widely used by employers, particularly for highly-skilled, highly-compensated employees. However, there is also evidence suggesting that a substantial number of lower-wage workers are subject to CNCs as well. Second, it appears that workers who deal with trade secret and other confidential business information are more likely to be covered by a CNC. Third, it appears

151. *Id.*

152. *Id.*

153. *See id.* at 854 (finding a 24% increase in dropout rates of participants subject to a noncompete).

154. *Id.* at 855. In contrast, subjects had a similar performance level in terms of error rates for the more creative assignment. *Id.*

155. *Id.* at 863; *see also id.* at 866 (“The results of this experimental study suggest that, under certain conditions, postemployment restrictions will suppress motivation to perform as well as degrade performance itself.”).

156. Guido Buenstorf, Christoph Engel, Sven Fischer & Werner Gueth, *Non-Compete Clauses, Employee Effort and Spin-Off Entrepreneurship: A Laboratory Experiment*, 45 RSCH. POL’Y 2113, 2114 (2016).

157. *Id.*

158. *Id.* at 2117.

159. *Id.*

160. *Id.* at 2121.

that many CNCs are limited in duration, often for two years or less. Fourth, some CNCs are also expressly limited by geographic scope and/or activity restrictions, but it is not clear how often or to what extent these limitations occur. Fifth, even though CNCs are less common among workers and firms in California—not surprising in light of that state’s general non-enforcement policy regarding CNCs—they are not entirely absent. Finally, using a variety of methodologies, a number of the studies conclude that CNCs significantly inhibit employee mobility.

While valuable, these empirical studies all have limitations that suggest a degree of caution is warranted in assessing their findings and their potential value for policymakers.¹⁶¹ First, many of these studies examine only a specific type of employer—such as large, publicly-traded firms—or a specific type of employee—usually highly educated and highly compensated workers, like CEOs and doctors—that limits the ability to extrapolate their findings to the more diverse American business and labor markets.¹⁶²

Second, only a handful of these studies involve the review of actual employment contracts (or other legally-binding documents, such as retention or bonus agreements) that may contain CNCs and other post-employment restrictions.¹⁶³ This is not surprising because employment contracts are generally not publicly available,¹⁶⁴ so most researchers have used other data sources, such as survey information, instead. But these alternative sources (which are essentially proxies) also have limits. For example, in the Starr et al. survey, nearly 30% of all respondents were unable to give a “yes” or “no” answer to the basic, threshold question of whether they had ever agreed to a CNC, with most of these (24.8%) indicating that they had never heard of CNCs.¹⁶⁵ As a result, the accuracy of self-reported information to the more detailed questions in this survey may also be in question. In addition, even though online surveys are now widely used in numerous academic disciplines due to their speed and relatively low cost, they may have their own biases and limitations compared to more traditional survey methods like telephone surveys or in-person interviews, including the representativeness of the responding population.¹⁶⁶

161. See Barnett & Sichelman, *supra* note 13, at 964 (contending that “these [empirical] studies suffer from significant methodological limitations, deliver statistically weak results, and do not provide compelling support for the view that banning noncompetes promotes innovation”).

162. See Barnett & Sichelman, *supra* note 71, at 5 (“Some studies focus on specific types of personnel, such as top executives, or types of firms, such as very large companies, that limit their applicability.”).

163. See Bishara et al., *supra* note 1, at 24 (“Since employment contracts are not generally publicly available, researchers have been unable to examine [them] empirically.”).

164. See *id.* at 3 (“[M]ost employment contracts are not publicly available, leaving researchers to speculate on the prevalence of these restrictions and their contents.”).

165. Starr et al., *supra* note 2, at 5.

166. See Corina Cornesse & Michael Bosnjak, *Is There an Association Between Survey Characteristics and Representativeness? A Meta-Analysis*, 12 SURVEY RSCH. METHODS 1, 9 (2018) (finding web-based surveys to be less representative than other single-mode survey methods); see also Dan Kahan, *What’s a “Valid” Sample? Problems with Mechanical Turk Study Samples, Part 1*, CULTURAL COGNITION PROJECT (July 8, 2013, 9:34 AM), <http://www.culturalcognition.net/blog/2013/7/8/whats-a-valid-sample-problems-with-mechanical-turk->

Third, empirical studies of CNCs based on court decisions are subject to the well-known selection effect. “[T]he selection effect refers to the proposition that the selection of tried cases is not a random sample of the mass of underlying cases” because “[c]ases only go to trial when the parties substantially disagree on the predicted outcome.”¹⁶⁷ Thus, “the disputes selected for litigation . . . will constitute neither a random nor a representative sample.”¹⁶⁸

Fourth, the underlying sources of information in several of the studies—particularly those relying on litigated cases—are now dated and thus may not be representative of current law and practice regarding CNCs. In particular, the Whitmore study relies in part on court opinions that are now fifty years old,¹⁶⁹ and the LaVan study uses cases dating back over thirty years as well.¹⁷⁰ But even some of the more recent studies that use survey evidence may be less-than-timely. For instance, Lavetti et al. rely on a 2007 survey of primary care physicians,¹⁷¹ but much has changed in both the practice and business of medicine since then, most notably the enactment, implementation, and attempts to repeal the Affordable Care Act.¹⁷²

Fifth, nearly all of these existing empirical studies focus primarily or exclusively on CNCs, ignoring other potential contractual limits on post-employment competition, such as NSAs that preclude the recruitment of an employer’s clients or employees and NDAs that prohibit the disclosure of trade secret and other confidential information after termination of employment.¹⁷³ As a result, these studies only paint at best a partial picture regarding employers’ use of contract law to limit post-employment competition from their former employees.

study-sam.html (criticizing the validity of surveys using Amazon Mechanical Turk for “the study of how cultural or ideological commitments” influence cognitive processes); Dan Kahan, *Fooled Twice, Shame on Who? Problems with Mechanical Turk Study Samples, Part 2*, CULTURAL COGNITION PROJECT (July 10, 2013, 9:30 AM), <http://www.culturalcognition.net/blog/2013/7/10/fooled-twice-shame-on-who-problems-with-mechanical-turk-stud.html> (elaborating further on the alleged invalidity of Mechanical Turk samples “for the study of culturally or ideologically” motivated reasoning due to selection bias, prior repeated exposure to study measures, and possible misrepresentation of nationality). *But see* Scott Clifford, Ryan M. Jewell & Philip D. Waggoner, *Are Samples Drawn from Mechanical Turk Valid for Research on Political Ideology?*, RSCH. & POL., Dec. 2015, at 1, 7 (“Our study . . . provides evidence for the validity of samples drawn from [Mechanical Turk] for psychological research on ideology.”).

167. Kevin M. Clermont & Theodore Eisenberg, *Trial by Jury or Judge: Transcending Empiricism*, 77 CORNELL L. REV. 1124, 1129 (1992) (quoting Theodore Eisenberg, *Testing the Selection Effect: A New Theoretical Framework with Empirical Tests*, 19 J. LEGAL STUD. 337, 337 (1990)). The seminal article on the “selection effect” is George L. Priest & Benjamin Klein, *The Selection of Disputes for Litigation*, 13 J. LEGAL STUD. 1 (1984).

168. Priest & Klein, *supra* note 167, at 4.

169. *See supra* notes 89–97 and accompanying text.

170. *See supra* notes 98–102 and accompanying text.

171. *See supra* notes 24, 122–128 and accompanying text.

172. *See generally* Neda Laiteerapong & Elbert S. Huang, *The Pace of Change in Medical Practice and Health Policy: Collision or Coexistence?*, 30 J. GEN. INTERNAL MED. 848 (2015) (describing the impact of the Affordable Care Act of 2010 on primary care physicians and their practices).

173. Bishara et al. is a notable counterexample; this study contains substantial data on both NSAs and NDAs. *See Bishara et al., supra* note 1.

In sum, despite the valuable and important work done by legal, business, and economics scholars so far, there is room for additional empirical research on CNCs and other post-employment restraints on competition, especially those that use actual employment agreements from a broad cross-section of the American workforce as data sources.

II. METHODOLOGY

This Part first details the research objectives of this empirical project. It then explains the study design and data collection process. Finally, it describes some potential limitations of the methodology described herein.

A. RESEARCH QUESTIONS

Rather than starting with the articulation of formal hypotheses, this project began by recognizing that the existing empirical literature on CNCs lacked a large-scale study of actual employment contracts that covered more than just a single, narrow class of employees (like CEOs).¹⁷⁴ Relatedly, there has been relatively little recent empirical scholarship on what types of firms and workers use CNCs, as well as their scope.¹⁷⁵ Further, the literature is overwhelmingly focused on one type of post-employment restraint—CNCs—and has largely ignored other contractual limits on competition that employers may use, such as NSAs and NDAs.¹⁷⁶

One as-yet-untapped source of employment contracts that could help shed light on these questions is federal trade secret litigation. Trade secret litigation was likely to be a fertile source of CNCs because employers may assert both CNCs and trade secrecy claims to protect their important business information.¹⁷⁷ Indeed, in a previous study of trade secret litigation in federal court under the recently-enacted Defend Trade Secrets Act (DTSA), the Author helped code whether complaints in these cases included or referred to a noncompete agreement.¹⁷⁸

174. See Bishara & Starr, *supra* note 23, at 534 (“The literature review makes clear that studies with the actual use of noncompetes are limited”); see also LEE EPSTEIN & ANDREW D. MARTIN, AN INTRODUCTION TO EMPIRICAL LEGAL RESEARCH 28 (2014) (noting that one “characteristic of a good research question is that it seeks to engage the existing literature,” including “spott[ing] a gap” in existing studies).

175. See Bishara & Starr, *supra* note 23, at 535–36 (“[A]t the most basic level . . . what is missing from the literature is an understanding of what types of firms use noncompetes, what types of workers sign noncompetes, what the conditions of the noncompete are, and why and when such noncompetes are used.”).

176. See *id.* at 536 (“[F]or states considering whether they should make the use of noncompetes illegal, it is important to know if firms . . . simply substitute other protection methods”).

177. See, e.g., Norman D. Bishara & David Orozco, *Using the Resource-Based Theory to Determine Covenant Not to Compete Legitimacy*, 87 IND. L.J. 979, 997–98 (2012) (noting a CNC claim may “be used in conjunction with other theories of knowledge ownership” such as “related trade secret . . . litigation against a former employee-owner”).

178. David S. Levine & Christopher B. Seaman, *The DTSA at One: An Empirical Study of the First Year of Litigation Under the Defend Trade Secrets Act*, 53 WAKE FOREST L. REV. 105, 133, 153 & n.290 (2018).

In addition, after a preliminary review of the literature and data, one hypothesis that emerged was the “so-called ‘California effect.’”¹⁷⁹ Specifically, scholars have assumed CNCs would be much less common in employment contracts for employees and firms located in California because CNCs are generally not enforceable there.¹⁸⁰ Prior empirical studies have found California residents are less likely to be covered by a CNC, but a substantial number of Californians nonetheless report having signed one.¹⁸¹

B. STUDY DESIGN AND DATA COLLECTION

An original dataset was created for this study.¹⁸² The starting point for data collection was the Author’s prior dataset of federal district court cases that involved a trade secret misappropriation claim in the one-year period following the DTSA’s enactment in May 2016 (“DTSA Dataset”).¹⁸³ As part of that study,¹⁸⁴ each case in the DTSA Dataset was hand coded for a variety of basic case information,¹⁸⁵ including the identity of the litigating parties,¹⁸⁶ the date when the first pleading asserting a DTSA claim was filed,¹⁸⁷ the district court where the case was filed,¹⁸⁸ the case’s docket number,¹⁸⁹ and the assigned judge.¹⁹⁰ To supplement this previously-collected data, the Author also searched the Lex Machina database for DTSA cases filed on or before May 11, 2017 (the one-year anniversary of the DTSA’s enactment).¹⁹¹ A total of 689 DTSA cases were identified through these methods.

179. Bishara et al., *supra* note 1, at 15.

180. *See id.* at 48 (noting that employment contracts for firms located in California “are much less likely to include noncompete clauses, as California state courts will not enforce the provisions”).

181. *See supra* notes 107, 124 and accompanying text.

182. In accordance with scholarly norms regarding empirical legal research, this dataset is being made publicly available upon the Article’s publication. *See* Robin Feldman, Mark A. Lemley, Jonathan S. Masur & Arti K. Rai, *Open Letter on Ethical Norms in Intellectual Property Scholarship*, 29 HARV. J.L. & TECH. 339, 348 (2016) (recommending that “data needed to replicate the results in a published empirical paper should be made accessible to other academics at the time the paper is published”). It will be available at the following website: <http://christopherbseaman.com>.

183. Levine & Seaman, *supra* note 178, at 124–25. We used a variety of sources to identify these cases, including full-text searches of court dockets in Bloomberg Law and searches of district court opinions in WestlawNext and Lexis Advance. *Id.* The full list of DTSA cases identified from these sources is available at <http://www.dtsalitigation.com>.

184. For more detail regarding coding of the DTSA Dataset, *see id.* at 125–33.

185. Variable names are listed in brackets in the following footnotes.

186. These were coded as two separate string (text) variables: [plaintiff] and [defendant]. If multiple plaintiffs or defendants were named, only the first named party was used for each variable. Levine & Seaman, *supra* note 178, at 125 nn.104–05.

187. This variable [date] was coded in the following format: MM/DD/YYYY. *Id.* at 125 n.106.

188. This variable [court] was coded using a three- or four-letter abbreviation consistent with the federal Public Access to Court Electronic Records system (“PACER”). *Id.* at 126 n.107.

189. This variable [docket] was coded in the following format: N:NN-CV-NNNNN (N is a number). *Id.* at 126 n.108.

190. This was coded as a string variable: [judge]. *Id.* at 126 n.109.

191. LEX MACHINA, <https://law.lexmachina.com> (last visited Apr. 19, 2021).

In the initial phase of coding for this project, the pleadings in each DTSA case were reviewed to determine if they mentioned or referred to a CNC or NSA that applied to a current or former employee. The number of employees in each case who were allegedly covered by these post-employment restraints was also identified.¹⁹² In total, 335 out of 689 cases (49%) included a reference to a CNC or NSA, covering a total of 532 employees.

Next, the online court docket was reviewed for these cases to locate the employment agreement or other document (such as a retention or bonus agreement) that contained the post-employment restraint(s).¹⁹³ For most employees, the full employment agreement containing the CNC and/or NSA was available in the online court docket, often as an exhibit or attachment to the complaint itself.¹⁹⁴ For employees where the agreement could not be located, information alleged in the complaint (or other relevant pleading) was used instead.¹⁹⁵

Each agreement was then hand coded for a variety of information.¹⁹⁶ First, it was coded for whether it contained a CNC, which was defined as a prohibition on working for or being employed by a competing firm, or otherwise engaging in competition against the former employer, after termination of employment.¹⁹⁷ The length (duration) of the CNC¹⁹⁸ and the geographic limit of the CNC, if any, was also coded.¹⁹⁹

Second, each agreement was coded for whether it included an NSA, which was defined as a prohibition on soliciting the former employer's customers and/or employees.²⁰⁰ Many employment agreements with a CNC also contained an NSA, even though the language of the CNC in many cases would also preclude conduct prohibited by the NSA.²⁰¹ Each agreement was also coded more granularly for whether the NSA prohibited soliciting customers or clients of the former employer,²⁰² whether the NSA prohibiting soliciting other

192. This was coded as a numeric variable: [empno]. In the final dataset, a separate entry was created for each employee subject to a noncompete.

193. We used Bloomberg Law's dockets feature to conduct this review. "We" in this context refers to the Author and his research assistants.

194. For 446 out of 532 employees (84%), the entire agreement was available. A hyperlink to each of these documents is contained in the following variable in the dataset: [noncomplete_link]. The agreement was only partially available for another 17 employees (3%), usually due to redaction of parts of the agreement.

195. This occurred for 69 out of the 532 employees (13%).

196. For more detail regarding the hand coding process, see *infra* notes 219–221 and accompanying text.

197. This was coded as a binary (dummy) variable: [cnc].

198. This was coded as a numeric variable for the CNC's duration in months after termination of employment: [cnc_time]. For example, a one-year CNC would be coded as 12.

199. This was coded as a categorical variable: [cnc_distance].

200. This was coded as a binary variable: [nsa].

201. Specifically, of the 351 employees subject to a CNC, 301 (86%) were also subject to an NSA.

202. This was coded as a binary variable: [nsa_customers].

employees of the former employer (for example, a non-raiding clause),²⁰³ or both.²⁰⁴ Finally, the length (duration) of each NSA was coded.²⁰⁵

Third, some additional information from the employment agreement was coded. This included the year that the agreement was entered into;²⁰⁶ the governing law specified in the agreement, if any;²⁰⁷ and whether the agreement contained an arbitration clause.²⁰⁸ The industry of the employer was also coded.²⁰⁹

Finally, information about the employee(s) covered by the CNC and/or NSA was coded. In particular, both the complaint and the employment agreement was reviewed to determine the employee's job title,²¹⁰ as well as the employee's base salary²¹¹ and eligibility for other compensation such as sales commissions, bonuses, and equity/stock incentive agreements,²¹² if available.

C. LIMITATIONS

Like virtually all empirical research, the methodology used in this study has limitations that could affect the results and implications discussed in the

203. This was coded as a binary variable: [nsa_employees].

204. This was coded as a categorical variable, based upon information from the previous two variables: [nsa_detail].

205. This was coded as two separate variables for the NSA's duration in months after employment: [nsa_time_customers] for NSAs involving customers and [nsa_time_employees] for NSAs involving employees].

206. This was coded as a four-digit number: [doc_year]. If multiple employment agreements for a single employee contained a CNC and/or NSA, the most recent available agreement was used.

207. This was coded as a two-letter variable based on the U.S. Postal Service code for the relevant state: [law]. For example, "CA" was used if the agreement specified that California law would apply to any dispute. "XX" was used if no governing law was identified in the agreement or if information regarding the governing law was not available. "OT" was used if the agreement specified that foreign (non-U.S.) law applied.

208. This was coded as a binary variable: [arbitrate]. An employer may seek to enforce a CNC in arbitration if the employment agreement authorizes it to do so. *See, e.g.,* Cynthia L. Estlund, *Between Rights and Contract: Arbitration Agreements and Non-Compete Covenants as a Hybrid Form of Employment Law*, 155 U. PA. L. REV. 379, 381 (2006) (noting that arbitration agreements for CNCs are "increasingly common, frequently litigated, and controversial"); *see also* Nitro-Lift Techs., L.L.C. v. Howard, 568 U.S. 17, 21–22 (2012) (*per curiam*) (overturning a state court decision that declined to submit a noncompete dispute to arbitration despite the existence of an arbitration clause in the employment agreement).

209. This was coded as a numeric variable based upon the employer's North American Industry Classification System (NAICS) code: [industry]. The NAICS is the standard used by federal statistical agencies in classifying business establishments for the purposes of collecting, analyzing, and publishing statistical data regarding the U.S. economy. *See* OFF. OF MGMT. & BUDGET, EXEC. OFF. OF THE PRESIDENT, NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (2017), https://www.census.gov/eos/www/naics/2017NAICS/2017_NAICS_Manual.pdf.

210. This was coded as a categorical variable: [job]. The following categories were used: President or Chief Executive Officer; Other Senior Management (for example, Vice President); Technical/Engineering Staff; Sales/Customer Service Staff; Owner/Former Owner; Other; Unknown. In addition, the job title of the employee (if available) was coded as a string variable: [job_title].

211. This was coded as numeric variable: [salary]. For employees paid at an hourly rate, the annual salary was calculated by multiplying their hourly rate by forty hours per week, by fifty weeks per year.

212. This was coded as a binary variable: [othercomp].

remainder of this Article.²¹³ This Subpart discusses several potential limitations and the Author's efforts to address them.

First, this study is based upon information from litigation, which is subject to the well-known selection effect. As previously mentioned, the cases that end up in litigation "constitute neither a random nor a representative sample . . . of all disputes."²¹⁴ One reason for this bias is that litigation is expensive; "[m]any disputes are resolved before a lawsuit is filed" because it is often more cost effective "to settle than to litigate."²¹⁵ In particular, this dataset is based on trade secret litigation, which can be quite expensive, even compared to other types of civil litigation in federal court.²¹⁶ As a result, parties may select other methods, such as alternative dispute resolution, to resolve their grievances.²¹⁷ Furthermore, if the employment agreement provides for resolution of disputes through mandatory arbitration, these cases also typically will not be litigated and thus will not appear in the dataset.²¹⁸

Second, the number of employment agreements in the dataset is relatively small given the estimated frequency of CNCs in the American workforce. In other words, it is difficult to draw any definitive conclusions regarding millions

213. See Michael Heise, *The Past, Present, and Future of Empirical Legal Scholarship: Judicial Decision Making and the New Empiricism*, 2002 U. ILL. L. REV. 819, 849 ("Data, research design, and statistical methods frequently enforce limits on what can be properly inferred from the results of empirical studies. . . . Notwithstanding these inherent and structural limitations, empirical methodologies are well-positioned to enhance and complement traditional legal scholarship."). Under best practices, authors of empirical legal research "should discuss limitations on the validity and generalizability of [their] empirical findings." Gregory Mitchell, Essay, *Empirical Legal Scholarship as Scientific Dialogue*, 83 N.C. L. REV. 167, 203 (2004).

214. Priest & Klein, *supra* note 167, at 4. It is worth noting that the Priest-Klein model is focused on empirical studies of outcomes (such as win rates) in litigation; as such, it defines the term "litigated" narrowly as only disputes where "a verdict is rendered." *Id.* at 4–6. This study, in contrast, starts with a larger group of DTSA cases involving a CNC or NSA and is not limited only to cases that reached a resolution on the merits.

215. Robert H. Gertner, *Asymmetric Information, Uncertainty, and Selection Bias in Litigation*, 1993 U. CHI. L. SCH. ROUNDTABLE 75, 75, 79; see also Theodore Eisenberg, *Litigation Models and Trial Outcomes in Civil Rights and Prisoner Cases*, 77 GEO. L.J. 1567, 1571 (1989) ("Both sides can save the costs of litigation by settling [a] dispute.").

216. See AM. INTELL. PROP. L. ASS'N, 2019 REPORT OF THE ECONOMIC SURVEY 68 (2019) (finding in a survey of IP attorneys that the median litigation cost for a trade secret case varied from \$550,000 (if less than \$1 million was at risk) to over \$7.5 million (if more than \$25 million was at risk)).

217. See generally Steven Shavell, *Alternative Dispute Resolution: An Economic Analysis*, 24 J. LEGAL STUD. 1 (1995) (examining reasons why parties would choose alternative dispute resolution as opposed to trial); Scott H. Blackman & Rebecca M. McNeill, *Alternative Dispute Resolution in Commercial Intellectual Property Disputes*, 47 AM. U. L. REV. 1709, 1728 (1998) (explaining that ADR is often preferred in trade secret litigation because "[b]y the very nature of the issues involved, usually at least one party . . . is very concerned about maintaining the secrecy of the trade secret or other confidential or proprietary information").

218. See *supra* note 208 and accompanying text. Even if an arbitration clause is included, however, some of these disputes may still end up in federal court for preliminary relief, such as a temporary restraining order or preliminary injunction. See, e.g., *Oldham Graphic Supply, Inc. v. Cornwell*, No. 09-1250-WEB-KMH, 2009 WL 3003850 (D. Kan. Sept. 17, 2009) (preliminarily enjoining former employee from engaging in business activities in violation of noncompete agreement pending the completion of arbitration proceedings); *St. Jude Med. S.C., Inc. v. Hasty*, No. CIV 06-4547, 2007 WL 128856 (D. Minn. Jan. 12, 2007) (granting a preliminary injunction against a former employee from violating noncompete and non-solicitation provisions and referring the matter to arbitration).

of CNCs (and other post-employment restraints) across a wide variety of firms and workers based upon a study of slightly over 500 employment agreements.

Third, many variables in the dataset were hand coded, which is a potential source of error. For example, if the variables are ambiguous or include room for subjectivity, this could result in inconsistent application and may negatively impact reproducibility.²¹⁹ However, this concern can be mitigated by creating, pilot testing, and implementing written coding instructions that all coders²²⁰ must follow, as was done in this project.²²¹ In addition, the Author personally reviewed all of the coding decisions to ensure accuracy.

Fourth, information for some of the variables was missing, either because the employment agreement was not available (and the complaint did not include sufficient information to code), or because certain information was not included in or redacted from the agreement. This was a particular issue, for example, for salary information, which was only available for 89 of the 532 employees (17%). This issue was addressed by indicating missing values in the dataset and reporting on this situation in the results below.

III. RESULTS

This Part summarizes the results from the collected data, primarily through descriptive statistics. It first provides a variety of information regarding the employees in the dataset who were subject to either a CNC, an NSA, or both, and their employers. It next summarizes data regarding CNCs in the employment agreements. Finally, it describes some information about NSAs in these agreements.

A. EMPLOYEES AND EMPLOYERS

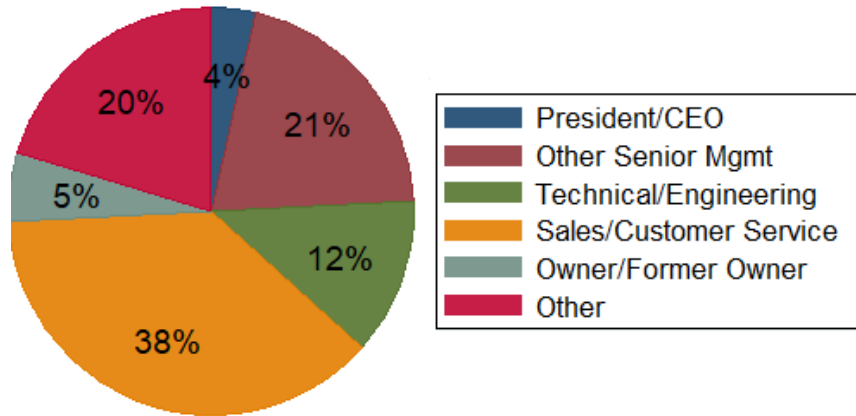
As previously described, the position (job type) and industry for each employee covered by a CNC and/or NSA was coded. Figure 1 below shows job types for these employees.

219. See EPSTEIN & MARTIN, *supra* note 174, at 95–105 (describing best practices for coding).

220. The coders for this project were law students who were employed as the Author's research assistants.

221. In empirical research, written coding instructions are preferred so that all coders apply the same criteria for each coding decision. This promotes consistency in coding and also serves as "a check against looking, consciously or not, for confirmation of predetermined positions." Mark A. Hall & Ronald F. Wright, *Systematic Content Analysis of Judicial Opinions*, 96 CALIF. L. REV. 63, 81 (2008); see also EPSTEIN & MARTIN, *supra* note 174, at 106–12 ("[T]he primary goal of a codebook is to minimize human judgment—to leave as little as possible to interpretation."). The written coding instructions for this project will be made available at: <http://christopherbseaman.com>.

FIGURE 1. EMPLOYEE JOB TYPES



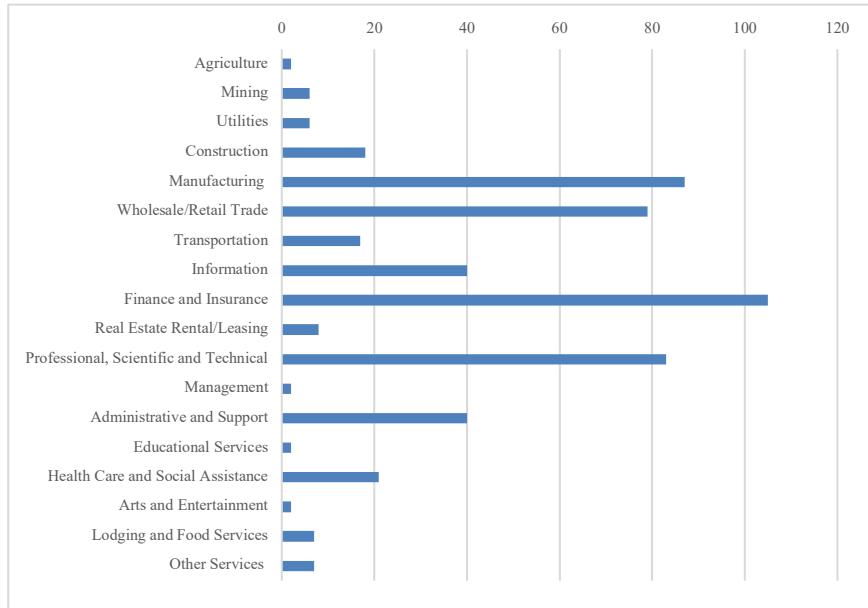
4% (19 employees) were the President or CEO, with another 21% (100 employees) as other senior management, such as a Vice President or Regional Manager. 12% (66 employees) worked in technical or engineering positions, while the largest group was sales and customer service staff at 38% (200 employees). 6% (29 employees) were current or former owners of a business,²²² while the remaining 20% (108 employees) had other job descriptions²²³ or their jobs were unknown.

Figure 2 below shows the industry in which the employees worked, based on the employer named in the relevant agreement.

222. These cases often involved CNCs and/or NSAs signed as a part of the sale of the owner's business to the new employer.

223. For example, independent contractors who were subject to a CNC and/or NSA were classified in this category.

FIGURE 2. INDUSTRY OF EMPLOYER



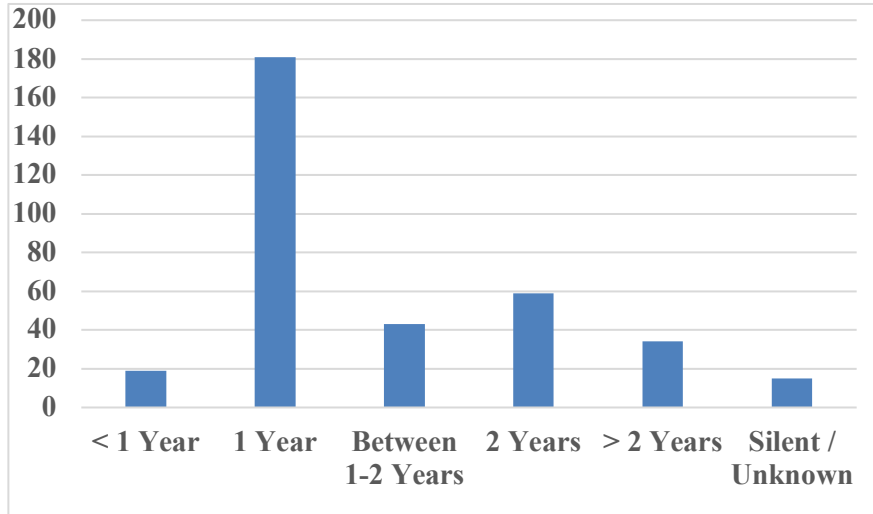
The most common industries represented in the dataset are: finance and insurance, 20% (105 employees); manufacturing, 17% (87 employees); professional, scientific, and technical services, 16% (83 employees); and wholesale and retail trade, 15% (79 employees). The next most common industries are: administrative and support services, 8% (40 employees); information services, 8% (40 employees); health care and social assistance, 4% (21 employees); construction, 3% (18 employees); and transportation, 3% (17 employees). The least common industries in the dataset are: real estate leasing and lending, 2% (8 employees); lodging and food services, 1% (7 employees); other services, 1% (7 employees); mining, 1% (6 employees); utilities, 1% (6 employees); agriculture, less than 1% (2 employees); education, less than 1% (2 employees); and management, less than 1% (2 employees).

B. COVENANTS NOT-TO-COMPETE

Of the 532 employees studied, 66% (351 employees) were covered by a post-employment CNC. This Subpart details the duration (length) and geographic scope of these CNCs, plus the salary information for employees covered by CNCs.

Figure 3 below reports the duration (length) of CNCs following termination of employment.

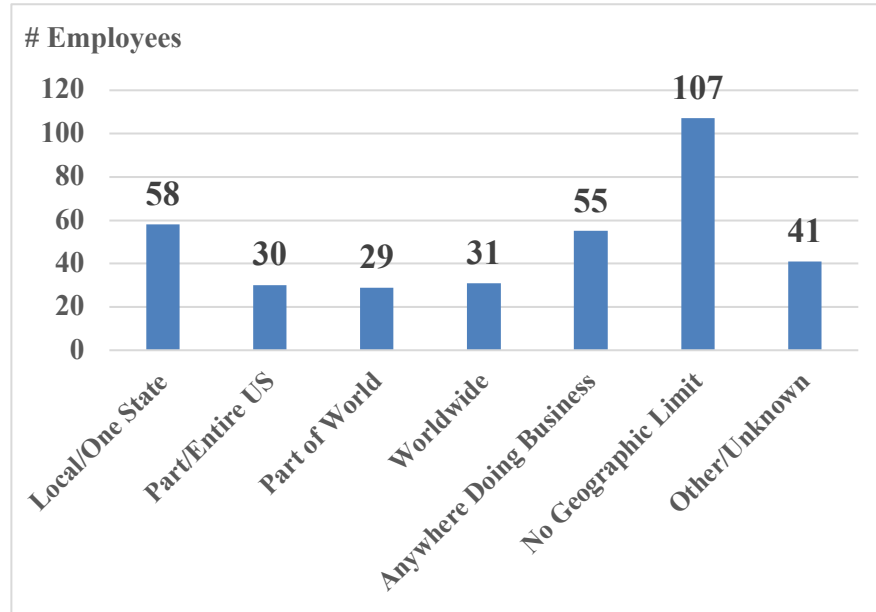
FIGURE 3. DURATION OF CNCs



The most common duration of a CNC is one year, for a slight majority of covered employees (52%, 181 employees), followed by two years as the next most common (17%, 59 employees). In total, 86% of CNCs were for two years or less. On the other end of the spectrum, 10% of CNCs (34 employees) were longer than two years, with 5% (16 employees) who were subject to CNCs of five years or more. In particular, owners or former owners of a business had a longer-than-normal CNC, with a mean duration of 32.5 months.

Figure 4 below reports the geographic scope of CNCs.

FIGURE 4. GEOGRAPHIC SCOPE OF CNCs



Almost 40% of all CNCs (138 employees) either did not have an express geographic limit or applied worldwide. 4% (14 employees) of CNCs applied to the entire United States, while an additional 8% of CNCs (29 employees) applied to the United States and at least one additional country (but less than the entire world). 5% (16 employees) of CNCs applied to only part of the United States (but greater than a single state), while 17% (58 employees) applied to one state or less (local). 16% (55 employees) of CNCs applied anywhere the employer did business. 5% (19 employees) of CNCs listed another geographic scope for the CNC (for instance, within a certain distance of anywhere the employee worked or serviced customers), and 6% (22 employees) of CNCs had an unknown geographic scope (for instance, if the employment agreement was not available).

The dataset also provided evidence to support the “California effect”—namely, that employees in California are less likely to be covered by a CNC.²²⁴ Of the 532 employees in the dataset, 42 of them were subject to employment

224. One potential limitation on this finding is that employers—knowing that a noncompete covering a California-based employee is likely invalid—probably will not sue to try to enforce it. As a result, employment agreements with unenforceable noncompetes would be less likely to appear in our dataset. But even unenforceable noncompetes may have an *in terrorem* effect that can decrease labor mobility. See Blake, *supra* note 12, at 682 (“For every covenant that finds its way to court, there are thousands which exercise an *in terrorem* effect on employees who respect their contractual obligations . . .”); see also Rachel Arnov-Richman, *The New Enforcement Regime: Revisiting the Law of Employee Competition (and the Scholarship of Professor Charles Sullivan) with 2020 Vision*, 50 SETON HALL L. REV. 1223, 1252 (2020) (reviewing the relevant literature and concluding that “*in terrorem* effects of noncompete agreements are not hypothetical”).

agreements governed by California law. Only two of these agreements (5%) contained a CNC.²²⁵ In contrast, of the remaining 496 employees with agreements not governed by California law, 72% (349 employees) included a CNC. This difference is statistically significant.²²⁶ Similarly, for trade secret litigation filed in a federal court in California, only 18% of cases (9 out of 49) involved an employment agreement with a CNC, compared to 71% (342 of 483) of employment agreements in cases filed outside of California. Again, this difference was statistically significant.²²⁷

Summary information regarding the annual base salaries (for instance, excluding bonuses, sales commissions, stock options, or other forms of financial incentives) of employees covered by CNCs is reported in Table 1 below.²²⁸

TABLE 1. ANNUAL BASE SALARY OF EMPLOYEES WITH CNC

| Percentile | Salary |
|--------------|-----------|
| 10% | \$42,000 |
| 25% | \$90,000 |
| 50% (Median) | \$120,000 |
| 75% | \$200,000 |
| 90% | \$600,000 |

The median base salary of all employees covered by a CNC is \$120,000, with the 25th percentile at \$90,000 and the 75th percentile at \$200,000. Notably, almost 30% of employees (19 of 65) subject to a CNC had an annual base salary of less than \$100,000, with 14% (9 of 65) having a base salary of \$50,000 or less. In sum, most employees covered by CNCs for whom base salary information was available fell within the top 20% of all Americans in terms of personal income, but CNCs also covered employees with base salaries as low as \$20,000 per year.

In terms of income by job types, Presidents and CEOs subject to a CNC had the highest median base salary (\$400,000), followed by other senior management (\$185,000). Technical and engineering staff subject to a CNC had a median base salary of \$82,500, and sales and customer service workers had a median base salary of \$85,000.²²⁹ Current and former owners subject to a CNC had a median base salary of \$225,000. Employees with other job types subject to CNCs had a median base salary of \$96,000.

225. In one of these cases, the presence or absence of a CNC could not be determined because the employment agreement was not available. *See* Complaint, Insight Global, LLC v. Beacon Hill Staffing Grp., LLC, 2018 WL 6573081 (N.D. Cal. Dec. 13, 2018) (No. 17-CV-00309).

226. The p-value for both Pearson's chi-square and Fisher's exact tests was < 0.001.

227. The p-value for both Pearson's chi-square and Fisher's exact tests was < 0.001.

228. Salary information was publicly available for 65 of 351 employees covered by a CNC. *See supra* Part II.C (noting this issue).

229. Notably, 14 of the 15 employees (93%) that fell into this category had an employment agreement that made them eligible for additional compensation, such as sales commissions and bonuses, meaning that these employees' total annual income was likely higher than their base salary.

C. NON-SOLICITATION AGREEMENTS

This study also examined evidence from employment agreements regarding the frequency and scope of NSAs. 90% of all employees (477 of 532) in the dataset were covered by an NSA. More detailed information regarding the frequency and type of these NSAs is listed in Table 2 below.

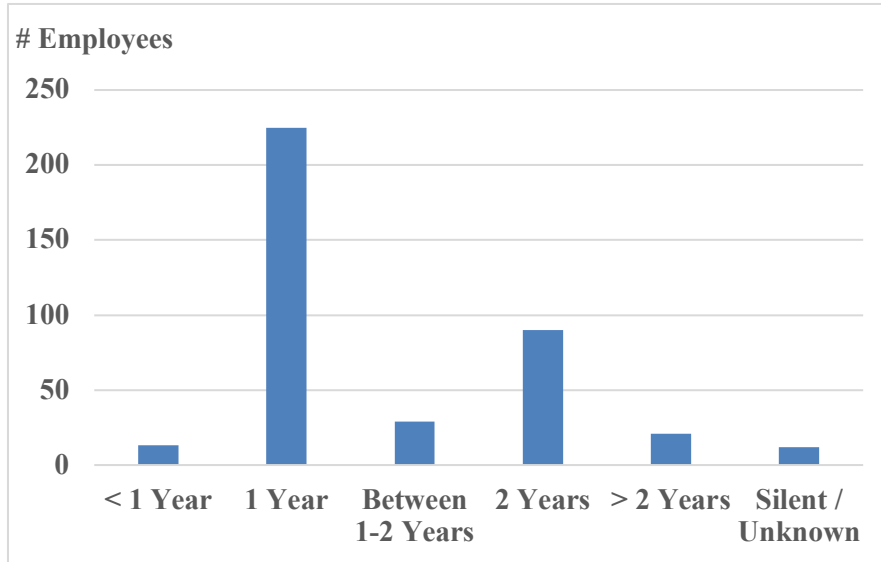
TABLE 2. FREQUENCY AND TYPE OF NSAs

| Type | # Employees | % Employees |
|------------------------------|-------------|-------------|
| Customers Only | 29 | 6% |
| Employees Only | 86 | 16% |
| Both Customers and Employees | 362 | 68% |
| No NSA | 45 | 8% |
| Unknown | 10 | 2% |

In particular, 73% of employees (391 of 532) in the dataset were prohibited from soliciting customers of their former employer, and 84% of employees (448 of 532) were subject to an anti-raiding clause (non-solicitation of other employees). Not surprisingly, sales and customer service staff (84%, 162 of 192 employees) and current and former business owners (84%, 16 of 19 employees) were most likely to be prohibited from soliciting the customers of their former employer.

The duration of NSAs was similar to CNCs. Figure 5 below shows the time length of NSAs prohibiting solicitation of customers of the former employer.

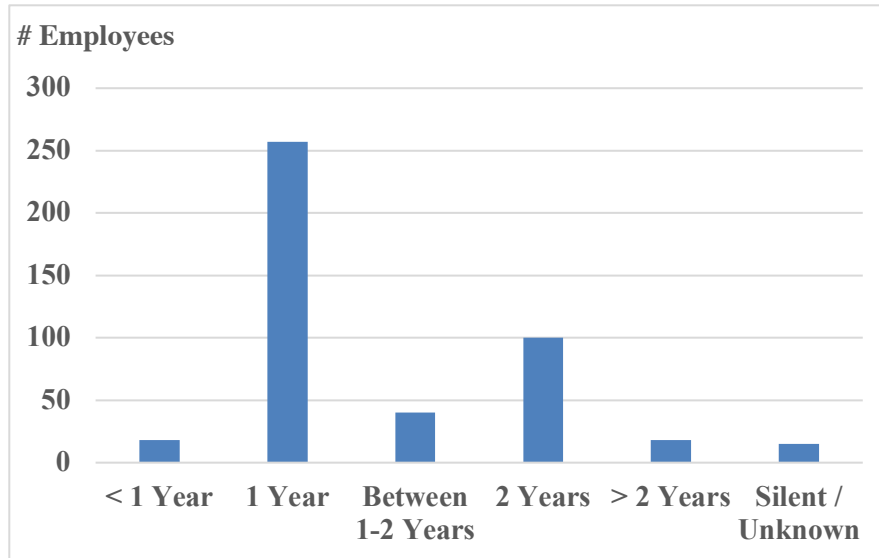
FIGURE 5. DURATION OF NSAs FOR CUSTOMERS



The most common length of an NSA prohibiting the solicitation of former customers was one year (58%, 225 of 391 employees), followed by two years (23%, 90 of 391 employees). Only 5% of employees (21 of 391) were subject to an NSA that lasted longer than 24 months. At the other end of the spectrum, only 3% of employees (13 of 391) had an NSA of less than a year.

Figure 6 below shows the duration of NSAs prohibiting the worker from soliciting other employees of the former employer (for instance, anti-raiding clause).

FIGURE 6. DURATION OF NSAs FOR OTHER EMPLOYEES



The distribution of the duration of NSAs prohibiting solicitation of other employees is very similar to that of NSAs prohibiting solicitation of former customers. The most common length of an NSA prohibiting the solicitation of other employees was one year (57%, 257 of 448 employees), followed by two years (22%, 100 of 448 employees). Only 4% of employees (18 of 448) were subject to an NSA that lasted longer than 24 months. At the other end of the spectrum, 4% of employees (18 of 448) had an NSA of less than a year.

Interestingly, the data also suggests that firms use NSAs as a partial substitute for CNCs for California-based employees. Of the 42 employment agreements that were governed by California law, all of them (100%) contained an NSA, compared to 90% of employees (440 of 490) with agreements governed by another jurisdiction's law. Similarly, nearly all cases (95%, 47 of 49 employees) filed in a federal court in California alleged a breach of an NSA.

Summary information regarding the annual base salaries (for example, excluding bonuses, sales commissions, stock options, or other forms of financial incentives) of employees covered by NSAs is reported in Table 3 below.²³⁰

230. Salary information was publicly available for 83 of 477 employees covered by a NSA. See *supra* Part II.C (noting this issue).

TABLE 3. ANNUAL BASE SALARY OF EMPLOYEES WITH NSA

| Percentile | Salary |
|--------------|-----------|
| 10% | \$42,000 |
| 25% | \$75,000 |
| 50% (Median) | \$110,000 |
| 75% | \$197,000 |
| 90% | \$400,000 |

The median base salary of all employees covered by an NSA is \$110,000, with the 25th percentile at \$75,000 and the 75th percentile at almost \$200,000. Almost 40% of employees (33 of 83) subject to an NSA had an annual base salary of less than \$100,000, with 20% (17 of 83) having a base salary of \$50,000 or less.

IV. IMPLICATIONS AND FUTURE RESEARCH

This Part first describes several implications from the results described above. It then discusses possible directions for future research regarding CNCs and other post-employment restraints on competition, as well as other contractual clauses that may impact innovation.

A. IMPLICATIONS

First, the results reinforce findings from previous empirical research that CNCs and other post-employment restraints on competition are frequently used by employers to cover workers in “high-skill, high paying jobs.”²³¹ Nonetheless, the data also suggests that a substantial number of lower-wage workers are covered by CNCs and/or NSAs as well. Specifically, approximately 15% of employees covered by CNCs for whom salary information was available had an annual base salary below the median U.S. household income.²³² This is consistent with the large-scale survey conducted by Starr et al., which found that 13.3% of workers who earn less than \$40,000 per year report being currently bound by a CNC.²³³ In particular, it raises questions about whether CNCs that cover low-wage, lower-skill employees are being used to protect an employer’s legitimate interests, or instead whether they are being improperly imposed “to

231. Starr et al., *supra* note 2, at 1.

232. See JESSICA SEMEGA, MELISSA KOLLAR, EMILY A. SHRIDER & JOHN F. CREAMER, U.S. CENSUS BUREAU, INCOME AND POVERTY IN THE UNITED STATES: 2019, at 4 fig.1 (2020), <https://www.census.gov/content/dam/Census/library/publications/2020/demo/p60-270.pdf> (showing a median household income of \$68,703 for 2019). The annual base salary may understate employees’ actual income, however, as it does not include any income from sales commissions, bonus, or stock incentives. See *supra* notes 222, 228 and accompanying text.

233. Starr et al., *supra* note 2, at 6. In total, 33.0% of employees who make less than \$40,000 per year report being ever bound by a CNC. *Id.*

exercise economic control over certain classes of employees” by limiting their freedom of mobility.²³⁴

Second, the employment agreements studied suggest that the primary limitation on the scope of CNCs is duration, rather than geography. Indeed, nearly half of all CNCs studied were effectively worldwide in their geographic scope.²³⁵ This was somewhat surprising, as the literature and case law on noncompetes indicates that geographic limits often are significant in determining whether a CNC is reasonable in scope.²³⁶ However, the absence of a geographic limitation in many CNCs may better comport with our modern, information-based economy. For example, even a small business may have a national or global customer base via the Internet, so competition could literally occur anywhere in the world.²³⁷ In addition, because CNCs are often used to protect against the disclosure of trade secret or confidential business information, a broad geographic scope may be appropriate, “because once an employee has divulged a trade secret in any location[,] the likelihood that it will become public knowledge available to immediate competitors is greatly increased.”²³⁸

234. *Narragansett Coated Paper Corp. v. Lapiere*, No. C.A. PC 97-2842, 1998 WL 388400, at *2 (R.I. Super. Ct. June 25, 1998); *see also Ecology Servs., Inc. v. Clym Env’t Servs., LLC*, 952 A.2d 999, 1004 (Md. Ct. Spec. App. 2008) (affirming trial court decision to decline enforcement of CNCs against “clearly low level employees” who were “not utilizing skills against whom covenants not to compete could be enforced”); *BHB Inv. Holdings, L.L.C. v. Ogg*, No. 330045, 2017 WL 723789, at *5 (Mich. Ct. App. Feb. 21, 2017) (refusing to enforce CNC for “a low-level employee with general knowledge and skills in swimming and swim instruction” because “[h]e had no valuable insider information that could be used for corporate espionage”).

235. *See supra* Part III.B.

236. *See* DONALD J. ASPELUND & JOAN E. BECKNER, *EMPLOYEE NONCOMPETITION LAW* § 6:8 (2020 ed.) (“Although sometimes characterized as preliminary considerations, area limitations are important ones. Area limitations frequently appear in covenants not to compete.”) (footnotes omitted); Blake, *supra* note 12, at 675 (“The traditional dimensions of a [CNC] have been those of duration and geographic area.”); Whitmore, *supra* note 24, at 489 (“When determining the enforceability of a [CNC], the court will examine many different factors, the most prominent of which are thought to be the length of the time restraint and the breadth of the geographical restraint.”) (footnote omitted); *see also Arcor, Inc. v. Haas*, 842 N.E.2d 265, 273 (Ill. App. Ct. 2005) (finding a CNC “unenforceable because it contained no geographic limitation” and thus was effectively a “blanket prohibition on competition”).

237. *See, e.g., PrecisionLR Inc. v. Clepper*, 693 F. Supp. 2d 286, 292–93 (S.D.N.Y. 2010) (finding that a CNC’s geographic limitation prohibiting competition anywhere in the United States and Canada was reasonable because the employer “has clients and does business over the Internet”); *Nat’l Bus. Servs., Inc. v. Wright*, 2 F. Supp. 2d 701, 708 (E.D. Pa. 1998) (holding that a CNC that applied in any state where the employer conducted business was reasonable in geographic scope because “[t]ransactions involving the Internet, unlike traditional ‘sales territory’ cases, are not limited by state boundaries”); *see also Friese v. Fadner Media Enters., LLC*, No. FSTCV146021437, 2017 WL 1238436, at *6–7 (Conn. Super. Ct. Jan. 18, 2017) (“[T]he law has come to acknowledge the inapplicability of geographic bounds to companies that do business on a national or international basis. This trend is particularly applicable to a business operating on the [I]nternet.”) (citations omitted).

238. Blake, *supra* note 12, at 679; *see also id.* at 675 (“Restraints mainly concerned with protecting confidential information are likely to be inadequate if they contain any geographic limitation”); *Universal Engraving, Inc. v. Duarte*, 519 F. Supp. 2d 1140, 1152–53 (D. Kan. 2007) (finding a CNC with a worldwide geographic scope to be reasonable because the employer’s “confidential information can be utilized through using a computer to transport the information, thus giving the information an easy route to travel worldwide, even if [the covered employee] did not move to another country”).

In comparison, current CNCs are, on balance, shorter in duration than those in previous empirical studies. Specifically, the most common length of a CNC in this study is one year, with the vast majority lasting two years or less.²³⁹ In contrast, the average duration of an enforceable CNC in the 1960s was over two years.²⁴⁰ In industries where innovation is rapid, such as biotechnology, CNCs that last more than a year may substantially impede innovation by effectively sidelining highly-skilled employees and interfering with their ability to keep up with ongoing change.²⁴¹ In addition, if the anticipated duration of a trade secret is short—for instance, if reverse engineering is common, or if other competitors can be expected to learn or independently discover the secret on their own—then CNCs of shorter duration may be appropriate.²⁴²

Third, the results in this study suggest that the “California effect”²⁴³ is real—in other words, that firms with California employees are less likely to include CNCs in their employment agreements. However, it also suggests that that California employers are using NSAs as an alternative to CNCs in an attempt to impose some post-employment limits on competition.²⁴⁴ This suggests that policymakers who are considering legislation limiting the enforceability of CNCs should also consider the potential anticompetitive impact of NSAs as well.

Fourth, the dataset contains examples of CNCs that appear to be facially invalid under current state law. For instance, even though noncompetes are generally unenforceable under California and Oklahoma law,²⁴⁵ several employment agreements with a choice of law clause for these states contain CNCs.²⁴⁶ Even though these covenants are unenforceable, they nonetheless may deter employees from changing jobs. As Cynthia Estlund has explained, “[e]ven a manifestly invalid non-compete may have *in terrorem* value against an employee without counsel.”²⁴⁷

239. See *supra* Part III.B.

240. See *supra* note 93 and accompanying text.

241. See Graves & DiBoise, *supra* note 73, at 330 (contending that “[a] one-year non-competition covenant is a substantial limitation on a skilled employee looking to find the most productive and innovative position available”).

242. See Blake, *supra* note 12, at 678 (“[W]hen the confidential information known by the employee will lose its business significance in a short period of time, that period sets the outside limit for the effective duration of the restraint . . .”).

243. See Bishara et al., *supra* note 1, at 15.

244. See *supra* note 57 (discussing the uncertain status of NSAs under California law).

245. See *supra* notes 48–51 and accompanying text.

246. See, e.g., Employee Confidentiality Agreement Between AllCells, LLC and Jack Y. Zhai 3 (June 1, 2010), <https://drive.google.com/file/d/1Bo-iFCmJcgJ4XzmKyMUNG2HgvSKQphJp> (including a one-year noncompete clause and selecting California as governing law); Employment Agreement Between SOAProjects, Inc., and Jayaraman Swaminathan 4–5 (July 7, 2008), https://drive.google.com/open?id=1RRC_kJu-D2uk6305E8KuSeCeCpYf-2j2 (stating terms of employment, including a one-year noncompete law, and selecting California as governing law); Employment Agreement Between Innovative Healthcare Systems, Inc., and Larry C. Winstead §§ 6, 13 (Jan. 1, 2008), <https://drive.google.com/file/d/19oJDD1GO23wzt0RRPey9vhK-Dmlxyv0/view> (containing a three-year noncompete clause and selecting Oklahoma as governing law).

247. Estlund, *supra* note 208, at 423; accord Catherine L. Fisk, Commentary, *Reflections on the New Psychological Contract and the Ownership of Human Capital*, 34 CONN. L. REV. 765, 782–83 (2002) (noting

Finally, the enactment of the DTSA has—perhaps inadvertently—opened the doors of federal courthouses across the country to hear claims that employees have breached post-employment restrictions on competition. As the Author found in a previous study, the majority of DTSA cases also involve breach of contract and/or employment law claims.²⁴⁸ Although breach of an employment contract is ordinarily a state law cause of action, federal courts can exercise supplemental jurisdiction over these claims when they are part of the same “case or controversy” as a federal law claim such as the DTSA.²⁴⁹ The alleged breach of a CNC is often factually intertwined with a federal trade secrets claim under the DTSA because one of the main purposes of a noncompete is to protect against the disclosure of trade secret information to a competitor.²⁵⁰ As a result, employment disputes involving CNCs and/or NSAs are being swept into federal court when, prior to the DTSA, they would have been heard in state court instead.²⁵¹

B. DIRECTIONS FOR FUTURE RESEARCH

There are a number of potential directions for expansion of this study’s empirical research into noncompetes and other post-employment restraints on competition. First, the number of employee agreements studied could be significantly expanded. This empirical study included slightly over 500 employment agreements that were identified in 689 cases, representing a single year of trade secret litigation in federal court under the DTSA. However, the entirety of trade secret litigation is much larger. For instance, Lex Machina²⁵² recently released a module of over 9600 trade secret cases filed in federal court since 2009.²⁵³ If these cases contain employment agreements with CNCs and/or NSAs at a rate comparable to the current dataset, this would result in thousands of additional documents for coding and incorporation into the dataset.

Second, the existing employment agreements (and any additional ones) could be coded for more variables. For instance, employers in these agreements could be coded based on size and location.²⁵⁴ In addition, employee job types

that some employers “may ask their employees to sign” contracts with unenforceable noncompete clauses, “presumably counting on the *in terrorem* value of the contract when the employee does not know that the contract is unenforceable”).

248. See Levine & Seaman, *supra* note 177, at 143 tbl.4 (finding that 70% of DTSA lawsuits also involved a breach of contract claim).

249. 28 U.S.C. § 1367(a); see also *Exxon Mobil Corp. v. Allapattah Servs., Inc.*, 545 U.S. 546, 558 (2005) (explaining that § 1367(a) confers “broad grant of supplemental jurisdiction over other claims within the same case or controversy, as long as the action is one in which the district courts would have original jurisdiction”).

250. See *supra* notes 67–70 and accompanying text.

251. See Dennis Crouch, *DTSA as a Shoe Horn for Contract and Employment Law Claims*, PATENTLY-O (Apr. 28, 2016), <https://patentlyo.com/patent/2016/04/contract-employment-claims.html>.

252. LEX MACHINA, <https://lexmachina.com> (last visited Apr. 19, 2021).

253. Press Release, Lex Machina, Lex Machina Launches Highly Anticipated Legal Analytics Module for Trade Secret Litigation (May 30, 2018), <https://lexmachina.com/media/press/lex-machina-launches-highly-anticipated-legal-analytics-module-for-trade-secret-litigation>.

254. Firm size information is available from a number of sources, including the U.S. Census Bureau’s Survey of Business Owners and Self-Employed Persons (SBO) and the U.S. Department of Labor’s Business

could be coded into more granular categories. Employment agreements could also be coded for information regarding the frequency and scope of non-disclosure agreements (NDAs). Furthermore, data regarding an employment contract's specified remedies for breach of a CNC, such as monetary damages, liquidated damages, preliminary and/or permanent injunctive relief, attorney's fees, and court costs, could be gathered.

Another possible area for future empirical research from employment agreements in trade secret litigation are other contractual terms regarding innovation. For instance, based on the Author's review, a number of employment contracts contain provisions regarding the assignment of inventions and patent rights. Some contracts also contain provisions regarding the employer's rights in other forms of intellectual property created by their employees during the course of employment, such as copyrights and trade secrets. In addition, many of the agreements included in the dataset also include language regarding remedies in the event that the contract's terms are breached, such as liquidated damages clauses and provisions awarding attorney's fees and court costs to a prevailing employer. In short, employment agreements publicly disclosed in trade secret litigation may prove to be a rich source of data regarding other contractual obligations that may affect the creation and ownership of intellectual property rights.

CONCLUSION

Noncompetes and other post-employment restraints on competition, such as nonsolicitation agreements, are one of the most significant and important issues not just in employment law, but in innovation policy and economic development as well. In light of the theoretical debate regarding the normative desirability of noncompetes, more data about the frequency, scope, and impact of these restraints is needed to assist policymakers who are grappling with these issues at both the federal and state levels.

This study makes a modest contribution to that effort by collecting and reporting information regarding an original dataset of employment agreements containing noncompetes and/or nonsolicitation agreements that have been publicly disclosed in trade secret litigation. Based on this data, it appears that the use of noncompetes by U.S. employers goes well beyond the C-suite and often extends to technical and sales staff. In addition, although employees subject to noncompetes often are well compensated, some lower-wage workers are also subject to them. Furthermore, it appears that firms employing California-based workers are using nonsolicitation agreements as an alternative to noncompetes. Finally, the data and methodology used in this study can be adapted to study a number of additional issues at the intersection of contract and employment law and innovation policy.

Employment Dynamics data. See *Survey of Business Owners and Self-Employed Persons (SBO)*, U.S. CENSUS BUREAU, <https://www.census.gov/programs-surveys/sbo.html> (last visited Apr. 19, 2021); *Business Employment Dynamics*, U.S. BUREAU OF LAB. STAT., <https://www.bls.gov/bdm/> (last visited Apr. 19, 2021).
