

Contractual Evolution

Matthew Jennejohn,[†] Julian Nyarko^{††} & Eric Talley[‡]

Conventional wisdom portrays contracts as static distillations of parties' shared intent at some discrete point in time. In reality, however, contract terms evolve in response to their environments, including new laws, legal interpretations, and economic shocks. While several legal scholars have offered stylized accounts of this evolutionary process, we still lack a coherent, general theory that broadly captures the dynamics of real-world contracting practice. This paper advances such a theory, in which the evolution of contract terms is a byproduct of several key features, including efficiency concerns, information, and sequential learning by attorneys who negotiate several deals over time. Each of these factors contributes to the underlying evolutionary process, and their relative prominence bears directly on the speed, direction, and desirability of how contractual innovations diffuse. Using a formal model of bargaining in a sequence of similar transactions, we demonstrate how different evolutionary patterns can manifest over time, in both desirable and undesirable directions. We then take these insights to a real-world data set of over two thousand merger agreements negotiated over the last two decades, tracking the adoption of several contractual clauses, including pandemic-related terms, #MeToo provisions, Committee on Foreign Investment in the United States (CFIUS) conditions, and reverse termination fees. Our analysis suggests that there is not a one-size-fits-all paradigm for contractual evolution. Rather, the constituent forces affecting term evolution manifest in varying strengths across differing circumstances. We highlight several constructive applications of our framework, including how the study of contract negotiation unfolds when price cannot easily be adjusted and how to incorporate other forms of cognitive and behavioral biases into our general framework.

INTRODUCTION	902
I. THEORIES OF CONTRACT EVOLUTION AND THEIR LIMITS	910

[†] Professor of Law, BYU Law School.

^{††} Assistant Professor of Law, Stanford Law School.

[‡] Isidor & Seville Sulzbacher Professor and Faculty Codirector of the Millstein Center for Global Markets & Corporate Ownership, Columbia Law School. The authors thank Rob Anderson, Ken Ayotte, Adam Badawi, Bobby Bartlett, Brian Broughman, Paul Edelman, Stavros Gadinis, Sven Hoeppner, Frank Partnoy, Bob Scott, Randall Thomas, George Triantis, and workshop participants at Columbia Law School, Duke Law School, Penn State, UC Berkeley School of Law, Vanderbilt Law School, and the Conference on Empirical Legal Studies for helpful comments on this project. Jamie Brumberger, Giuliana Carozza Cipollone, Kai'anui Graham, Madisyn Klein, Emily Park, Tanner Schenewark, and Jessica Volmar provided excellent research assistance. Special thanks to Annalee Hickman Pierson for exceptional library support. All errors remain the authors'.

A. “Too Cold”: When Contract Terms Become Frozen in Time	913
B. “Too Hot”: Self-Interested Lawyers Overwork Contractual Language.....	916
C. “Just Right”: Incremental Contractual Innovation Is Achieved	916
D. The Limits of Prior Research	918
II. A GENERAL MODEL OF CONTRACTUAL EVOLUTION	919
A. The Setting	920
B. Sequence of the Model and Informational Environment	922
1. Composition of population	922
2. Baseline belief about composition of population	923
3. Signal of the deal	923
4. Prior experience	924
C. Model Simulations	925
1. The benchmark case	927
2. The strength of the prior belief (r_0).....	928
3. The number of law firms (N)	929
4. The accuracy of the signal (γ).....	930
5. Special cases.....	932
III. AN ASSORTMENT OF DIFFUSION PATHS IN THE M&A MARKET	936
A. MAEs and Pandemic Carveouts.....	937
B. CFIUS Regulatory Covenants	942
C. Reverse Termination Fees	946
D. #MeToo Representations	951
E. Top-Up Options.....	954
F. Choice-of-Law and -Forum Provisions	956
G. Formal Calibration and Testing.....	959
IV. IMPLICATIONS	960
CONCLUSION	963

INTRODUCTION

Most corporate transactions win deservedly scant attention in the popular press. But every so often, one becomes the centerpiece of cocktail-party conversation. Such a deal came along in November 2019, when iconic U.S. luxury-goods maker Tiffany & Co. disclosed that it was being acquired by LVMH Moët Hennessy Louis Vuitton (LVMH), the French luxury-goods giant, in a \$16.2 billion transaction.¹ When the tie-up was announced, there

¹ See Press Release, LVMH & Tiffany & Co., LVMH Reaches Agreement with Tiffany & Co. 1 (Nov. 25, 2019), <https://perma.cc/4BAX-KAQL>; see also Holly Ellyatt, *LVMH Confirms Deal to Acquire Tiffany for \$16.2 Billion*, CNBC (Nov. 25, 2019), <https://perma.cc/L93T-36J4>; Roberta Naas, *LVMH Acquires Tiffany & Co. for \$16.2 Billion*, FORBES (Nov. 26, 2019), <https://perma.cc/E6C4-PYJR>.

were plenty of reasons for optimism. The deal came in the middle of the longest-running economic expansion in U.S. history,² and, in all respects, it looked like the latest blockbuster marriage in a string of shrewd acquisitions during the tenure of LVMH's chairman, Bernard Arnault, whose storied dealmaking had fortified the LVMH empire.³ If there was any question surrounding the deal, it was about whether LVMH could pull Tiffany out of its longstanding struggle to attract younger clientele.⁴ Brushing such concerns aside, LVMH's CFO confidently quipped that "[l]ove will prevail."⁵ LVMH and Tiffany's love story, however, was star-crossed from the start. Only three months after the deal was announced—and well before its scheduled closing—the coronavirus pandemic overwhelmed the global economy, ushering in the deepest economic contraction in modern memory.⁶ LVMH and Tiffany were forced to shutter many locations, with no dependable timeline for reopening.⁷ A transaction that once looked like a rocket

² See *Business Cycle Dating*, NAT'L BUREAU OF ECON. RSCH., <https://perma.cc/WCV9-6YPL>; *U.S. Business Cycle Expansions and Contractions*, NAT'L BUREAU OF ECON. RSCH. (last updated July 19, 2021), <https://perma.cc/ZQS7-J43V>; see also Carmen Reinicke, *The US Economic Expansion Is Now the Longest in History*, MKTS. INSIDER (July 2, 2019), <https://perma.cc/2XYT-8T88>; David John Marotta, *Longest Economic Expansion in United States History*, FORBES (Jan. 21, 2020), <https://perma.cc/D3ST-KM9Q>.

³ See Vanessa Friedman, *Bernard Arnault Just Bought Tiffany. Who Is He?*, N.Y. TIMES (Nov. 25, 2019), <https://perma.cc/ELQ5-RAAD>.

⁴ See Chauncey Alcorn, *Tiffany Needs to Attract Millennials. The Company that Hired Rihanna and A\$AP Rocky Wants to Help*, CNN BUS. (Oct. 29, 2019), <https://perma.cc/9MJW-Y5B4>; Subrat Patnaik & Siddharth Cavale, *Tiffany's 'Old-World Luxury' Fails to Charm Millennials*, REUTERS (May 26, 2016), <https://perma.cc/KXZ6-CJ29>; Vauhini Vara, *Tiffany's Sparkly Surge Reflects a Divided Moment in America*, THE ATLANTIC (Aug. 29, 2018), <https://perma.cc/MRP3-HCMT>; Dora Mekouar, *Millennials Not Interested in Tiffany Jewelry, Gap Clothes*, VOA (Feb. 25, 2020), <https://perma.cc/36ER-AQUX>.

⁵ Amie Tsang & Vanessa Friedman, *Luxury Giant LVMH to Buy Tiffany for \$16.2 Billion*, N.Y. TIMES (Nov. 25, 2019), <https://perma.cc/UE8H-KMCG>.

⁶ See Nelson D. Schwartz, *Coronavirus Recession Looms, Its Course 'Unrecognizable'*, N.Y. TIMES (Mar. 21, 2020), <https://perma.cc/J547-CVYH>; Alan Rappeport & Jeanna Smialek, *I.M.F. Predicts Worst Downturn Since the Great Depression*, N.Y. TIMES (Apr. 14, 2020), <https://perma.cc/4PPD-Y4D3>; Press Release, World Bank Group [WBG], COVID-19 to Plunge Global Economy into Worst Recession Since World War II, WBG Doc. 2020/209/EFI (June 8, 2020), <https://perma.cc/3LY9-VD89>.

⁷ See *Tiffany & Co to Temporarily Shut Several Stores, Cuts Hours at Others*, REUTERS (Mar. 17, 2020), <https://perma.cc/MR88-FJ37>; Kim Bhasin, *LVMH Says Revenue Has Dropped as Much as 20% Due to Coronavirus*, BLOOMBERG, (Mar. 27, 2020), <https://perma.cc/NKT8-FAN6>; Patrick M. Graham, *Tiffany Indicates Coronavirus Outbreak Will Cause Significant Hit to 2020 Results*, PROACTIVE (Mar. 20, 2020), <https://perma.cc/AWV4-VMKV>; John Harrington & Samuel Stebbins, *30 of America's Iconic Businesses That Closed Due to Coronavirus*, USA TODAY (Apr. 10, 2020),

ship now more closely resembled a train wreck, and LVMH indicated that it would look for a way out.⁸

In the end, it was not love that prevailed; rather, it was a contract. Buried within the seventy-page agreement that memorialized the LVMH-Tiffany merger was a provision that provided LVMH with the potential off-ramp that it so desperately sought. One of the conditions of LVMH's obligation to close the transaction was that Tiffany's business would not have experienced a material adverse effect (MAE), the equivalent of a force majeure ("Act of God") provision that appears in myriad other contracts.⁹ LVMH seized on the language, declaring that the pandemic had, in fact, visited an MAE on Tiffany's operations, and LVMH therefore had the right to walk away from the deal.¹⁰

Tiffany responded in the way that jilted lovers sometimes do—by litigating. In the Delaware Court of Chancery, it argued that the force majeure provision had several exclusions that prevented LVMH from treating COVID-19 as an MAE.¹¹ LVMH countered by observing that while there were indeed several express exclusions pertaining to natural and political disasters, the contract was silent as to public-health crises in general (and COVID-19 in particular). In fact, they argued, the meticulous inclusion of a list of very specific, express exclusions made it all the more convincing that pandemic-related events had been deliberately omitted from the list of exclusions.¹²

Setting aside the merits of these arguments, the overall economics of the merger still appeared strong, and the costs and risks

<https://perma.cc/ZG4M-LEAQ>; Jonathan Garber, *Tiffany & Co. Loses \$65M as Coronavirus Shuttles Stores*, FOX BUS. (June 9, 2020), <https://perma.cc/V54B-EL3J>.

⁸ See, e.g., Lauren Hirsch & Elizabeth Paton, *Tiffany's \$16 Billion Sale Falls Apart in Face of Pandemic and Tariffs*, N.Y. TIMES (Sept. 9, 2020), <https://perma.cc/3HC8-43S3>.

⁹ Tiffany & Co., Agreement and Plan of Merger 62 (Form 8-K, Exhibit 2.1) (Nov. 25, 2019), <https://perma.cc/NRU9-74RA>.

¹⁰ See LVMH's Verified Counterclaim and Answer to Verified Complaint ¶¶ 37–40, 55–56, *Tiffany & Co. v. LVMH Moët Hennessy-Louis Vuitton SE*, No. 2020-768 (Del. Ch. Sept. 28, 2020), 2020 WL 5870414; see also Press Release, LVMH (Sept. 9, 2020), <https://perma.cc/26MW-2ZXG>; see also Hirsch & Paton, *supra* note 8; *Timeline: LVMH Calls Off \$16 Billion Tiffany Takeover*, REUTERS (Sept. 9, 2020), <https://perma.cc/Z5MV-L9BW>; Amelia Lucas & Lauren Thomas, *LVMH Scraps \$16.2 Billion Deal with Tiffany*, CNBC (Sept. 9, 2020), <https://perma.cc/U556-ELYW>; Anne D'Innocenzio, *Luxury Goods Giant LVMH Cancels \$14.5B Deal for Tiffany*, WASH. POST (Sept. 9, 2020), <https://perma.cc/M7JB-KLPM>.

¹¹ See Verified Complaint ¶ 5–6, *Tiffany & Co.*, No. 2020-768.

¹² LVMH's Verified Counterclaim and Answer to Verified Complaint, *supra* note 10, ¶ 4.

of litigating the outcome were appreciable. It was therefore unsurprising that in late 2020, the parties returned to the negotiating table to recut the deal. They ultimately agreed to shave the purchase price by about a half-billion dollars, short-circuiting the uncertain outcome of LVMH's efforts to escape the deal.¹³ Although Tiffany's dowry had shrunk considerably, it was not to suffer the Whistledown-worthy¹⁴ humiliation of being left at the altar.¹⁵

While the LVMH–Tiffany dispute made international headlines, its basic facts recount a saga that has played out repeatedly during the pandemic. Over the last year, an unprecedented series of corporate transactions have immersed the Delaware courts in MAE claims.¹⁶ And beyond the context of mergers and acquisitions (M&A), similar claims arising out of changed circumstances have increased dramatically in many commercial and noncommercial settings, ranging from supply chains to higher education to Hollywood.¹⁷

¹³ See Press Release, LVMH & Tiffany & Co., Tiffany and LVMH Modify Merger Price (Oct. 29, 2020), <https://perma.cc/TZ3Q-TXVW>; see also Sarah White & Silvia Aloisi, *LVMH and Tiffany End Luxury Battle, Cut Price on \$16 Billion Takeover*, REUTERS (Oct. 29, 2020), <https://perma.cc/ZDD2-C58G>; David Dawkins, *Billionaire Bernard Arnault Snags \$400 Million Price Reduction in High-Risk Tiffany Takeover Talks*, FORBES (Oct. 29, 2020), <https://perma.cc/WF4W-4FMQ>; Vanessa Friedman & Elizabeth Paton, *Tiffany Deal Is a Signature Move by the Sun Tzu of Luxury*, N.Y. TIMES (Oct. 30, 2020), <https://perma.cc/3SJ7-SDC2>.

¹⁴ For those who are unfamiliar, see James Poniewozik, *'Bridgerton' Is a Sparkly Period Piece with a Difference*, N.Y. TIMES (Dec. 23, 2020), <https://perma.cc/5XXN-8Y4J>.

¹⁵ The deal closed on January 7, 2021. Tiffany & Co., Current Report (Form 8-K) (Jan. 7, 2021), <https://perma.cc/J23C-VE32>; Press Release, LVMH, LVMH Completes the Acquisition of Tiffany & Co. (Jan. 7, 2021), <https://perma.cc/4D5C-CBRS>.

¹⁶ See generally, e.g., *AB Stable VIII, LLC v. MAPS Hotel & Resorts One, LLC*, No. 2020-310, 2020 WL 7024929 (Del. Ch. Nov. 30, 2020); *Realogy Holdings Corp. v. SIRVA Worldwide, Inc.*, No. 2020-311, 2020 WL 4559519 (Del. Ch. Aug. 7, 2020); Verified Complaint, *The We Co. v. Softbank Grp. Corp.*, No. 2020-258 (Del. Ch. Apr. 7, 2020); Verified Complaint, *XHR Santa Barbara, LLC v. SBG US Holdings PTE*, No. 2020-395 (Del. Ch. May 22, 2020); *Yatra Online, Inc. v. Ebix, Inc.*, No. 2020-444, 2021 WL 3855514 (Del. Ch. Aug. 30, 2021); Verified Complaint, *SPay, Inc. v. Stack Media, Inc.*, No. 2020-540 (Del. Ch., July 1, 2020).

¹⁷ See Tim McCarthy, *COVID-19 and Force Majeure: A Closer Look at the Supply Chain Clause of the Moment*, INDUSTRYWEEK (July 9, 2020), <https://perma.cc/K8QV-6V3S>; Jessica Everett-Garcia, Keith Miller, T. Markus Funk & Evelyn Pang, *These Defenses May Help Universities in Covid-19 Lawsuits*, BLOOMBERG L. (Aug. 14, 2020), <https://perma.cc/G2DV-7HGH>; David Robb & Nellie Andreeva, *SAG-AFTRA Addresses Talks with Studios on "Applicability of Force Majeure" for Actors Impacted by COVID-19 Shutdown*, DEADLINE (Apr. 23, 2020), <https://perma.cc/4ZAW-2SJX>; Lee Brenner & Adam Kwon, *How Hollywood COVID-19 Force Majeure Claims May Play Out*, LAW360 (Mar. 27, 2020), <https://perma.cc/P4NF-RLZ2>.

For lawyers and those studying the law, part of the allure of these disputes stems from their foundational origins in basic contract law. Whether it pertains to a corporate combination,¹⁸ a conceiving cow,¹⁹ a closed canal,²⁰ or a cancelled coronation,²¹ courts have long struggled to assess whether, when, and how the law should intervene in contractual risk allocation during moments of unanticipated surprise or severe economic dislocation.²² But the role of the law in this process is not limited to litigated outcomes. Even before the phalanx of Tiffany and LVMH lawyers filed their complaints, a different set of legal actors—transactional lawyers—played a critical role in crafting the language of the written contract itself. Their language was destined to be parsed in excruciating detail to determine whether and how it allocated risks and uncertainties around yet-to-unfold events.

This contract-design task is no mean feat: as economic conditions change, the choices made by these transactional attorneys can tip the balance of risks and incentives for trillions of dollars' worth of agreements. Accordingly, drafters must carefully consider whether an evolving environment requires them to write new, untested provisions to address each emerging risk. Interestingly, the lawyers making these decisions often work alone and with little input from other stakeholders such as CEOs, CFOs, boards, or investment bankers. When lawyers hammer out these terms, those stakeholders will have left the negotiating table, satisfied that they could reach a consensus on the most essential attributes of the deal, such as the price.

What makes this dynamic especially compelling is how frequently it unfolds across many different contexts. It applies not only to M&A agreements but also to sovereign debt,²³ choice-of-

¹⁸ See, e.g., *Hexion Specialty Chems., Inc. v. Huntsman Corp.*, 965 A.2d 715, 721 (Del. Ch. 2008).

¹⁹ See *Sherwood v. Walker*, 33 N.W. 919, 919 (Mich. 1887).

²⁰ See *Transatlantic Fin. Corp. v. United States*, 363 F.2d 312, 312 (D.C. Cir. 1966).

²¹ See *Krell v. Henry* [1903] 2 KB 740, 742.

²² See Victor P. Goldberg, *Price Adjustment in Long-Term Contracts*, 1985 WIS. L. REV. 527, 536–37, 541.

²³ See generally Robert E. Scott, Stephen J. Choi & Mitu Gulati, *Anticipating Venezuela's Debt Crisis: Hidden Holdouts and the Problem of Pricing Collective Action Clauses*, 100 B.U. L. REV. 253 (2020); Stephen J. Choi, Mitu Gulati & Robert E. Scott, *Variation in Boilerplate: Rational Design or Random Mutation?*, 20 AM. L. & ECON. REV. 1 (2018) [hereinafter *Variation in Boilerplate*]; Stephen J. Choi, Mitu Gulati & Robert E. Scott, *The Black Hole Problem in Commercial Boilerplate*, 67 DUKE L.J. 1 (2017) [hereinafter *The Black Hole Problem*]; Stephen J. Choi & Mitu Gulati, *The Pricing of Non-price Terms in Sovereign Bonds: The Case of the Greek Guarantees*, 1 J.L. FIN. & ACCT. 1 (2016); Stephen J. Choi, Mitu Gulati & Eric A. Posner, *The Dynamics of Contract Evolution*, 88

forum provisions,²⁴ financings, and countless other contracts where performance takes place far into an unknown future. In each instance, the lion's share of negotiation points is delegated to lawyers. As these actors move from client to client (and contract to contract), they function as important conduits through which contracting conventions—and thus market practices—unfold and evolve over time.

Yet this evolutionary process is rarely studied by scholars. To be sure, the evolutionary behavior of *prices* is a familiar topic among economists, who have developed elaborate theories to explain and predict such movements.²⁵ And among legal scholars, there is no shortage of attention paid to the evolution of legal *doctrine* for its interesting, if sometimes controversial, evolutionary traits. But the tools of private ordering that precede, animate, and actuate the structure of the myriad other (nonprice) terms within contracts are generally not part of the discussion. And understanding the nature of contract innovation strikes at the heart of contract law and policy.

At the same time, the academic literature on contract-term evolution remains modest, fragmented, and highly context specific. Some have analogized contract terms to prices, arguing that they evolve efficiently when exposed to market pressures and execution by rational parties.²⁶ Others have countered that contracts simply do not have the same exposure to market dynamics,

N.Y.U. L. REV. 1 (2013) [hereinafter *The Dynamics of Contract Evolution*]; Stephen J. Choi, Mitu Gulati & Eric A. Posner, *The Evolution of Contractual Terms in Sovereign Bonds*, 4 J. LEGAL ANALYSIS 131 (2012) [hereinafter *The Evolution of Contractual Terms in Sovereign Bonds*]. See also Robert E. Scott, Stephen J. Choi & Mitu Gulati, *Revising Boilerplate: A Comparison of Private and Public Company Transactions*, 2020 WIS. L. REV. 629, 630–31 [hereinafter *Revising Boilerplate*].

²⁴ See generally Julian Nyarko, *Stickiness and Incomplete Contracts*, 88 U. CHI. L. REV. 1 (2021).

²⁵ See generally, e.g., LÉON WALRAS, *ELEMENTS OF THEORETICAL ECONOMICS* (Donald A. Walker & Jan van Daal eds. & trans., Cambridge Univ. Press 2014) (1874); Gerard Debreu, *Excess Demand Functions*, 1 J. MATHEMATICAL ECON. 15 (1974); Wayne Shafer & Hugo Sonnenschein, *Market Demand and Excess Demand Functions*, in 2 HANDBOOK OF MATHEMATICAL ECONOMICS 671 (K.J. Arrow & M.D. Intriligator eds., JP1982).

²⁶ See, e.g., Alan Schwartz & Robert E. Scott, *Contract Theory and the Limits of Contract Law*, 113 YALE L.J. 541, 559–61 (2003); Eric Talley, *Discharging the Discharge for Value Defense*, 18 N.Y.U. J.L. & BUS. 147, 153–54 (2021) (documenting the rapid rise of “Revlon blocker” provisions after a dramatic federal court holding on mistaken payments). This analogy assumes, of course, the same sorts of conditions that lead to pricing efficiency—i.e., that there are no distortions in the market, such as the abuses of market power that antitrust law is meant to address.

with some scholars advancing the thesis that evolutionary movements are virtually nonexistent, displaying a staunch rigidity akin to a “black hole.”²⁷ Yet others have used nearly the same observation about the lack of market discipline to argue in favor of a “churning” effect, with rapid mutations that reflect incentives of the drafters that stand in direct conflict with their clients’ interests.²⁸ Some have even proposed that transactional lawyers make unnecessary modifications simply to increase their billable hours.²⁹

But beyond these stylized accounts, we still have surprisingly scant knowledge of the forces behind the evolution of contractual terms. Can we predict when, whether, and how new “mutations” to contract terms arrive and under what circumstances they will make substantial incursions on contracting practices? What role do lawyers play in this evolutionary process, either by promoting the diffusion of a new term or by hindering it? And if lawyers do play a role, do they create or destroy value in the process?

For several interrelated reasons, the answers to these questions are vitally important but thus far elusive: First, we still lack a general theory about how contracts evolve over time and, in particular, how this process is intermediated by the actors who structure these terms. Second, empirical evidence for contractual evolution is often limited to isolated examples, preventing us from testing or calibrating a more general theory. Having a broad understanding of contractual evolution is of particular importance in today’s volatile environment, in which the economic, political, and social milieus are undergoing significant and rapid change.

In this Article, we marshal both theoretical and empirical tools to study contractual evolution.³⁰ On the theoretical side, we develop a general, holistic model of contract structuring in which contract provisions are progressively embraced or abandoned by

²⁷ *The Black Hole Problem*, *supra* note 23, at 3.

²⁸ See generally Robert Anderson & Jeffrey Manns, *The Inefficient Evolution of Merger Agreements*, 85 GEO. WASH. L. REV. 57 (2017).

²⁹ *Id.* at 68.

³⁰ Note that our focus is on negotiated commercial agreements and not contracts of adhesion often used in the consumer context. See generally Giuseppe Dari-Mattiacci & Florencia Marotta-Wurgler, *Learning in Standard Form Contracts: Theory and Evidence* (N.Y.U. L. & Econ. Rsch. Paper Series Working Paper No. 18-11, 2018); Kevin E. Davis & Florencia Marotta-Wurgler, *Contracting for Personal Data*, 94 N.Y.U. L. REV. 662 (2019); Yannis Bakos, Florencia Marotta-Wurgler & David R. Trossen, *Does Anyone Read the Fine Print? Consumer Attention to Standard Form Contracts*, 43 J. LEGAL STUD. 1 (2014); Florencia Marotta-Wurgler & Robert Taylor, *Set in Stone? Change and Innovation in Consumer Standard-Form Contracts*, 88 N.Y.U. L. REV. 240 (2013).

a community of lawyers acting sequentially. Many contracts with significant economic stakes fall into this category, including financings, asset purchases, acquisitions, and licensing arrangements. Our model helps show how a variety of factors interact to affect whether and under what circumstances a contractual mutation will be embraced by the industry. In particular, we show that such diffusion is a function of several inputs, including information, experience, and lawyer networks. When lawyers are well positioned to ascertain the value-creating attributes of a mutation, contracts can evolve quickly and efficiently to match changing environments. In other cases, legal actors need to gain experience with a new mutation over time—a constraint that can slow its evolutionary trajectory and even cause some degree of mismatch. Throughout this process, the structure of lawyer networks can play an important role, providing lawyers a conduit both to transmit their experiences to one another and to sharpen their individual expertise. Using simulations to analyze our model, we generate several predictions about how mutations are likely to manifest over time, what diffusion paths those mutations might take, how desirable those paths are, and whether lawyers appear to be adding value to the process.

In a second step, we export the intuitions acquired from our simulations to the real world. Using a large dataset of over two thousand M&A transactions that we collected and labeled by hand, we track the evolution of a series of important contractual innovations and the degree to which they are embraced or rejected by the networks of lawyers who structure them.³¹ Our analysis strongly suggests that not all contract terms are created equal within our research design: we uncover evidence that the distinct evolutionary paths identified by our model also play out in actual market practice. Some terms clearly bear the markers of well-informed lawyers tailoring their contracts to the clients

³¹ We made this data set—including the raw corpus from which the labels are generated—publicly available at CONTRACTUAL EVOLUTION, www.jennejohnnyarkotalley.com. These contractual terms include the following: pandemic-related force majeure provisions discussed above; #MeToo (or “Weinstein”) provisions, in which a target company represents that no allegations of sexual harassment or misconduct have been made against its senior executives; Committee on Foreign Investment in the United States (CFIUS) provisions, which allocate the risk of federal national security review; reverse termination fees, which specify the amount that the buyer will pay to the target company if the buyer terminates the deal for certain reasons; top-up options, which allow a bidder to effect a short-form merger in situations where a tender offer does not result in the buyer achieving an ownership interest over 90%; and choice-of-law and -forum provisions.

that they represent. Others, however, demonstrate adoption patterns that seem unlikely to be highly bespoke. In addition, some diffusion paths combine more than one pattern, such as when a shock upends existing practices and spurs new innovation in the market. M&A agreements do not follow a single evolutionary path; they follow many.

Our analysis has important implications for law, policy, and future research. Foremost, our analysis can help highlight when and whether lawyers add significant value to deals. They also help us understand the conditions under which legal-term innovation is most likely to occur in practice and whether such innovations are more likely to be temporary or durable contributions. Our analysis may also shed light on how courts should interpret such language—not only when it is included in a contract but also when it is left out.

The remainder of this paper proceeds as follows. Part I provides an overview of the legal literature on contract-term evolution, showing that, at present, it largely consists of stylized canonical intuitions that talk past one another. Part II introduces our own theory and model of contract evolution. It combines many of the features of the existing arguments within a single framework. We then use simulations to show how different diffusion patterns can arise under varying contractual environments, such as under a highly concentrated or a dispersed market for the provision of legal services. Part III applies these insights to real-world data involving significant M&A agreements. We track the adoption and diffusion of a variety of contract mutations over the years, including pandemic-related force majeure clauses, #MeToo provisions, and reverse termination fees. Our analysis confirms that there is great heterogeneity in the diffusion paths of our example terms, and a one-size-fits-all, stylized account is likely not appropriate. Part IV discusses a variety of implications of our analysis for both contract theory and negotiation theory. A final Part concludes. A technical appendix includes some of the formal derivations of our modeling results for the technically minded reader.

I. THEORIES OF CONTRACT EVOLUTION AND THEIR LIMITS

The innovation and diffusion of contracts is a topic that is seldom discussed in traditional contract law. As law students learn each year in their first-year contracts courses, a central (if somewhat idealized) principle of Anglo-American contract law is

that contract terms are thought to embody and reflect the intentions of the parties who negotiated them.³² Under this idealized account, the terms of an agreement are mechanically customized by the parties to channel their particular intent. Although certain special types of written instruments, including mass-market consumer contracts, are a recognized exception to this account, it is still common to think that major transactions comport with the traditional narrative.

Consequently, it can seem misplaced to talk about the “innovation” of contract terms and the diffusion of new contractual language within large, significant, dickered transactions. After all, to negotiate a contract is to breathe life into new terms, and thus every contract is in some ways an innovation, with no necessary tether to what came before.

For the same reasons, the idea of a “diffusion” of a new contract term also seems an odd fit within the standard paradigm. While parties negotiating separate agreements may coincidentally employ similar contractual language as their predecessors, doing so hardly seems to describe a diffusion process. By definition, tailoring a contract to each deal implies that early contracts should have little to no effect on successors. Viewed in this sense, if two deals converged on similar (or identical) contractual terms, it would simply be an accident of fate—much like when Newton and Leibniz each independently stumbled upon key principles of calculus in the seventeenth century.³³

Even for large, seemingly bespoke deals, however, the idea that terms are rigorously reset *de novo* for each transaction misses the mark. In settings where transactions with facially similar characteristics occur frequently, there are several potential benefits to standardizing and emulating contractual language from one deal to the next. First, reusing boilerplate language allows the designer to exploit economies of scale, like the Ford Motor Company accomplished a century ago with the standardized design of the Model T.³⁴ Not unlike an automobile, there can be many moving parts in a large transactional instrument. And for many of those parts, the benefits of customization may not justify the costs.

³² See Jody S. Kraus & Robert E. Scott, *Contract Design and the Structure of Contractual Intent*, 84 N.Y.U. L. REV. 1023, 1025–26 (2009).

³³ See D.B. MELI, *EQUIVALENCE AND PRIORITY: NEWTON VERSUS LEIBNIZ: INCLUDING LEIBNIZ'S UNPUBLISHED MANUSCRIPTS ON THE PRINCIPIA* 7 (1993).

³⁴ Barak Richman, *Contracts Meet Henry Ford*, 40 HOFSTRA L. REV. 77, 79–82 (2011).

Second, standardized contractual language can lead to greater certainty in interpretation if a dispute about the language lands in front of a court or arbitrator. Judicial precedents are a public good, and familiar terms are more likely to have accumulated meaning from previous interpretations. Courts have long been cognizant of this externality of precedents, and they have emphasized the importance of the uniformity and predictability of boilerplate language—a benefit that is not lost on contracting parties.³⁵

Finally, the evolutionary path of contractual terms from deal to deal may be a particularly good way for lawyers to learn from each other and from their prior selves. A well-designed contract provision is more likely to withstand the test of time, and its serial emulation may constitute a diagnostic signal of its quality. By the same token, if a novel form of contractual language diffuses throughout a market, it can send an informational signal along the way as lawyers incorporate it into their own deals. As Paul Cravath put it rather floridly over a century ago, such terms may reflect “the experience and prophetic vision of a great many able lawyers.”³⁶

Likewise, standardization will necessarily cause the language of a contract to diverge from specific intentions of the parties to the agreement.³⁷ No longer completely tethered to the immediate circumstance, contractual language can take on a life of its own, transcending the bargaining context of any given deal. Over time, in fact, the widespread adoption of a boilerplate provision among participants in a market can lead to extreme outcomes. In cases where the term is deeply entrenched, the cost of switching to a new and untested version of the term can become prohibitive.³⁸ And in such cases, contractual language becomes highly path dependent, potentially undermining the market’s ability to embrace good innovations while weeding out bad ones.

³⁵ See, e.g., *Sharon Steel Corp. v. Chase Manhattan Bank, N.A.*, 691 F.2d 1039, 1048–49 (2d Cir. 1982) (discussing the need for uniformity in interpreting boilerplate successor-obligor clauses).

³⁶ Paul D. Cravath, *Reorganizations of Corporations*, in *SOME LEGAL PHASES OF CORPORATE FINANCING, REORGANIZATION, AND REGULATION* 153, 178 (1917).

³⁷ See generally Robin Bradley Kar & Margaret Jane Radin, *Pseudo-Contract and Shared Meaning Analysis*, 132 HARV. L. REV. 1135 (2019). See also Stephen J. Choi & G. Mitu Gulati, *Contract as Statute*, 104 MICH. L. REV. 1129, 1168–69 (2006).

³⁸ See Marcel Kahan & Michael Klausner, *Standardization and Innovation in Corporate Contracting (or “The Economics of Boilerplate”)*, 83 VA. L. REV. 713, 727–29 (1997).

What factors lead to path dependency in some situations but rapid evolution and diffusion in others? The existing research on that question has produced multiple explanations. Some view the pace of contractual evolution as “too cold”—i.e., standardized terms become frozen in time so that even momentous shocks in the market struggle to stimulate a change in contractual language. Others posit that contract evolution is “too hot”—i.e., transactional lawyers constantly churn contractual language, adding clauses here and tinkering with terms there, with little purpose other than to increase the client’s bill. That said, the most traditional story of contracting posits that contract evolution is (approximately) efficient, yielding to the forces of market competition or effective organizational routines within law firms. In that sense, it can be described as the “just right” account. We discuss each account in turn below.

A. “Too Cold”: When Contract Terms Become Frozen in Time

The greatest amount of recent scholarly attention has focused on scenarios in which contractual innovation is inhibited. According to this theory, sophisticated companies and their lawyers sometimes fail to improve on their contractual terms, leading to inefficiency and, at times, catastrophe.³⁹

One significant branch of this literature argues that the expectations of other participants in the market contribute to a contractual “lock-in.” Parties expect to see certain standardized terms in a deal.⁴⁰ One reason is familiarity: as a contract term becomes more widely adopted, its value becomes more certain (compared to the less certain value of idiosyncratic terms), particularly as courts, arbitrators, and other third-party actors interpret them over time.⁴¹ A related reason for lock-in is that deviations from standard, market terms may be viewed as a negative signal of a party’s quality. In many transactions, information about a party’s ability and inclination to fully perform its contractual obligations is not easily observed. If a party proposes a novel

³⁹ See MITU GULATI & ROBERT E. SCOTT, *THE 3 1/2 MINUTE TRANSACTION: BOILERPLATE AND THE LIMITS OF CONTRACT DESIGN* 3–4 (2013).

⁴⁰ Standardized terms become more useful as their adoption within a market grows—a phenomenon familiar to many technologies, such as operating systems or hardware interfaces. See Douglas Gale, *Standard Securities*, 59 REV. ECON. STUD. 731, 735–39 (1992) (analyzing coordination failures in securities contracts); Kahan & Klausner, *supra* note 38, at 730.

⁴¹ See Gale, *supra* note 40, at 734–35 (identifying an “unfamiliarity premium” for unfamiliar securities).

formation of a standard contractual term during negotiations, their counterparts may become suspicious that the nonstandard proposal is indicative of an undisclosed (and therefore likely negative) hazard.⁴² As a result, parties will stick to standard terms to avoid giving the impression that they pose a heightened risk for breach.

To combat contractual lock-ins, innovation sometimes requires concerted action in the market. In a game-theoretic sense, market participants' choice to abandon a standard term for a new formulation is a type of coordination problem.⁴³ And a central feature of coordination games is the notion of strategic complementarity—i.e., one player's incentive to take a certain strategy increases as others take that same strategy.⁴⁴ For agents to find it in their interests to pursue the new strategy, they must be convinced of widespread agreement over the change, either explicit or tacit, among other participants in the market—here, an agreement to shift from an old standard term to a new one. As the size of the market grows, the costs of such coordination increase, and shifting the market to a new equilibrium may be prohibitively costly without facilitation from a formal institution, such as a trade association.⁴⁵

⁴² See *id.*

⁴³ See generally THOMAS SCHELLING, *MICROMOTIVES AND MACROBEHAVIOR* (1978). See also THOMAS SCHELLING, *THE STRATEGY OF CONFLICT* 89–92 (2d ed. 1980).

⁴⁴ See Gale, *supra* note 40, at 749–50.

⁴⁵ Empirical research has identified two major coordination patterns. The first pattern—a gradual adjustment to a new equilibrium after an external shock—has been observed in multiple studies of the sovereign-debt market, where a large number of bondholders participate in the market (and coordination costs are therefore high). The external shock in these studies is typically a novel judicial interpretation of an old boilerplate provision, which demonstrates to market participants the need for a new and improved term. These studies find that, despite how obvious the need for a new term may be, the market is reluctant for months or even years to adopt a new formulation, with adoption only gaining steam once a coordinating event—such as intervention by a major institution (e.g., a trade association)—occurs. See *The Black Hole Problem*, *supra* note 23, at 38–40 (discussing the role that a set of meetings among major market participants which played in coordinating the shift to a new contractual standard); *The Dynamics of Contract Evolution*, *supra* note 23, at 23–24 (discussing the role of the International Monetary Fund in coordinating the shift to a new contractual standard); *The Evolution of Contractual Terms in Sovereign Bonds*, *supra* note 23, at 162; Stephen J. Choi & G. Mitu Gulati, *Innovation in Boilerplate Contracts: An Empirical Examination of Sovereign Bonds Conference on Sovereign Debt Restructuring*, 53 EMORY L.J. 929, 935–36 (2004).

That gradual model of contract innovation differs from the swifter—or “light switch”—model of change observed when coordination costs are relatively low. For instance, a study found that after a simultaneous shock to both the corporate-bond market and the acquisition market for privately held companies, the adoption of a new contract term began almost immediately in the privately held company-acquisition market, where participation

A second branch of the lock-in literature focuses on internal dynamics within law firms as a source of contractual path dependency. Whereas the literature discussed above emphasizes the network effects that arise due to interdependence among participants in a market, this substrand of research emphasizes what might be considered the contractual “production process” within law firms. This work argues that the way in which contracts are designed can matter for innovation as much as network effects.

Research focusing on the production process tends to highlight how practices and routines that lawyers use in contract design interfere with innovation. It begins with an observation that appears mundane at first glance: transactional lawyers often use precedent documents and model agreements when designing their agreements. Those templates may be from prior deals that the law firm has done or may be publicly available agreements by other firms that are readily available on databases like the Securities and Exchange Commission’s (SEC) EDGAR database of public filings. Deal lawyers may use portions of those precedent agreements wholesale—contract design by copy and paste.⁴⁶ Or they may use precedent as a starting point, tweaking it in subsequent iterations.

The reason for reusing boilerplate may reflect risk aversion. Particularly in bargains with high stakes, a lawyer may not wish to venture into uncharted territory by including a new contractual formulation that, while arguably superior to precedent, increases their exposure to blame if a problem between the contracting parties later arises.⁴⁷

The end result is, once again, that established terms can become frozen in time. Not only are contract terms in stasis, however. The meaning of the language can also degrade as lawyers reuse it without reflection from one deal to the next. A contract term may appear in an agreement, but what it actually means has been lost to memory.⁴⁸ Devoid of real intent, the term functionally becomes a “contractual black hole.”⁴⁹

is concentrated and coordination costs are therefore low. In comparison, change in corporate bonds was much more gradual. *See* *Revising Boilerplate*, *supra* note 23, at 647–53.

⁴⁶ *See generally* Claire A. Hill, *Repetition, Ritual, and Reputation: How Do Market Participants Deal with (Some Types of) Incomplete Information?*, 2020 WIS. L. REV. 515.

⁴⁷ *See* GULATI & SCOTT, *supra* note 39, at 149.

⁴⁸ *See* *Variation in Boilerplate*, *supra* note 23, at 3–4; GULATI & SCOTT, *supra* note 39, at 140–41.

⁴⁹ *See generally* *The Black Hole Problem*, *supra* note 23.

B. “Too Hot”: Self-Interested Lawyers Overwork Contractual Language

In stark contrast to the literature highlighting contractual stasis, the rote usage of contract terms may also invite the opposite dynamic. Indeed, some scholars have advanced the argument that contractual language is sometimes too quick to change—even when those changes do not further the clients’ interest. Under this accounting, contractual innovation is “too hot.”

One formulation of this reasoning focuses on product differentiation. Particularly in new and evolving fields and applications, transactional attorneys may be in a competition to set the standard for deals on the horizon. Under this approach, clients may be particularly attracted to those lawyers who they perceive to be setting the standard, assuming them to have greater expertise and experience in an area. Anticipating this reaction, of course, law firms may be incentivized to change the contractual language as a means of signaling their expertise to the market. In these scenarios, firms may introduce trivial alterations to well-established terms in an attempt to differentiate their legal offerings. Such strategic tailoring may represent churning a contract by making immaterial adjustments.⁵⁰

Product differentiation of this sort leads to a pattern of contract evolution different from the models emphasizing path dependence discussed above. Deliberately altering yesterday’s deal terms on the margins leads to an increase in diversity in the market. For instance, Professors Robert Anderson and Jeffrey Manns depict developments in contract terms as “phylogenetic trees” that reveal how the incremental changes result in “drift” over time.⁵¹

C. “Just Right”: Incremental Contractual Innovation Is Achieved

The third, and perhaps most traditional, line of argument identifies circumstances where contract evolution proceeds at a pace that is “just right” on average, evolving to best fit the exigen-

⁵⁰ See Anderson & Manns, *supra* note 28, at 68, 88–89.

⁵¹ *Id.* at 77–78.

cies at the time. Not only does this account comport with the neoclassical-economics view of contracting,⁵² but it also aptly describes a long and pedigreed account of corporate law in general.⁵³ In the context of M&A transactions, there appears to be further support for this theory. For example, Professor John Coates IV found evidence that M&A agreements are neither fully customized to each deal nor completely boilerplate, instead exhibiting a type of “constrained variation.”⁵⁴

What drives certain contracts to fall within this intermediate category rather than one of the two extremes is not entirely obvious, although it can be hypothesized that the interests of the clients are incorporated by the transactional lawyers to at least some extent. A steady cadence of efficient contractual innovation may be achieved because clients screen for quality in their attorneys, and quality requires a lawyer to internalize the clients’ interests. Similarly, law firms may develop internal organizational routines and incentives that effectively support client-driven innovation rather than encouraging deal teams to rely too much on internal boilerplate templates.⁵⁵ Alternatively, industry trade associations may be particularly effective in reducing the coordination costs that impede contractual innovation. Professor Lisa Bernstein’s classic studies of how industry associations in a variety of commodity industries regularly update standardized form contracts provide one such example.⁵⁶

Under any of these accounts, one might expect contract terms to evolve in an efficient direction on average—in some cases arriving there very quickly. Such a dynamic is also most consistent with efficiency considerations, suggesting that any evident lock-in might simply be an optimal gravitation to a provision that is categorically value enhancing.

⁵² See generally R.H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1 (1960).

⁵³ See FRANK H. EASTERBROOK & DANIEL R. FISCHEL, *THE ECONOMIC STRUCTURE OF CORPORATE LAW* 1–39 (1991).

⁵⁴ John C. Coates IV, *M&A Contracts: Purposes, Types, Regulation, and Patterns of Practice*, in *RESEARCH HANDBOOK ON MERGERS AND ACQUISITIONS* 29, 35–38 (Claire A. Hill & Stephen Davidoff Solomon eds., 2016); see also Matthew Jennejohn, *Transformation Cost Engineering*, 2020 WIS. L. REV. 573, 586–93 (providing empirical evidence that the standardization of different terms differs across different categories of M&A contracts).

⁵⁵ See Matthew Jennejohn, *The Architecture of Contract Innovation*, 59 B.C. L. REV. 71, 94–95 (2018).

⁵⁶ See generally, e.g., Lisa Bernstein, *Private Commercial Law in the Cotton Industry: Creating Cooperation Through Rules, Norms, and Institutions*, 99 MICH. L. REV. 1724 (2001); Richard A. Epstein, *Confusion About Custom: Disentangling Informal Customs from Standard Contractual Provisions*, 66 U. CHI. L. REV. 821 (1999).

D. The Limits of Prior Research

While the research reviewed above significantly enriches our theory of how contracts are designed, it also raises several vexing questions. Conventional contract theory teaches us that the design of an agreement turns on the unique bargaining dynamics between negotiating parties—a setting that may itself change over time. Yet each of the various accounts above suppresses the mechanics of how, precisely, this dynamic process unfolds. Contract provisions may become resistant to change due to third-party expectations within a market, shortfalls of expertise among advisers, asymmetric flows of information in a market, lawyers' dysfunctional drafting practices, or slack between lawyers and the clients who pay them to design their agreements. In each case, the emergence of boilerplate terms seems to emphasize that contracts are not expressly bargained for; rather, they are the result of a production process, with bargaining dynamics sitting off-stage. This is the opposite of contractual economics' message.

Setting this issue aside, there remain important limitations that prior research has not yet overcome. First, although prior research gives us a punch list of possible factors that may inhibit contractual innovation, it provides little direction on how to combine these factors into a coherent theory that explains how they interact or when one factor is more influential than others.

Relatedly, many commercial agreements are complex, including dozens or even hundreds of terms, but scholarship tends to study terms in isolation.⁵⁷ This obscures the possibility that factors contributing to path dependency affect agreements asymmetrically, with some terms standardized and others customized. This middle-ground category of agreements is found in important markets, such as the market for corporate control. M&A agreements are neither fully customized to each deal nor completely boilerplate, instead exhibiting “constrained variation.”⁵⁸

Finally, prior studies typically build conceptual models of contract innovation that are specific to certain markets rather

⁵⁷ See generally, e.g., Jeffrey T. Macher & Barak D. Richman, *Transaction Cost Economics: An Assessment of Empirical Research in the Social Sciences*, 10 BUS. & POL. 1 (2008); Cathy Hwang & Matthew Jennejohn, *The New Research on Contractual Complexity*, 14 CAP. MKTS. L.J. 381 (2019). But see generally *The Dynamics of Contract Evolution*, *supra* note 23; *The Evolution of Contractual Terms in Sovereign Bonds*, *supra* note 23.

⁵⁸ See Coates, *supra* note 54, at 6; Jennejohn, *supra* note 54, at 581 (providing empirical evidence that the standardization of different terms differs across different categories of M&A contracts).

than constructing generalizable models that can be deployed across a variety of exchange environments. Gaining meaningful traction in this area going forward will require scholars to stitch together these stylized examples into a unified theory.⁵⁹

This Article takes an important step toward addressing those gaps in the literature. It provides a general model of contract evolution that combines multiple constraints on innovation, captures dynamics across a variety of agreement types and terms, and applies to any number of markets. The next Part turns to this task in earnest, informally introducing the basic moving parts of our model.

II. A GENERAL MODEL OF CONTRACTUAL EVOLUTION

In order to generate intuitions about when, why, and how contract terms change over time, this Part develops a formal model of contract-term evolution. To frame our discussion, we will employ a canonical, timely example pertaining to the adoption of a pandemic-related exclusion in an M&A deal, much like the Tiffany–LVMH dispute discussed above. Nevertheless, as discussed in the Introduction, the framework that we present below is quite general, and it advances a mechanism for contract-term evolution that could plausibly apply to any contractual scenario where legal actors play a pivotal role in contract design.

Before proceeding, we pause briefly to note that our methodological approach uses a formal model to generate several intuitions. Our purpose in undertaking this approach is motivated, in some measure, by our observation above that the legal scholarship still lacks a unified theory of contract-term evolution. Part of that disunity stems from the absence of a single framework within which to evaluate such evolution. This is where formal models can provide great utility.

To be sure, formal models frequently attract criticism because they are said to be unrealistic, as they do not capture the complexity of real-world scenarios. While this criticism has some merit, it is important to understand that any model is—by definition—a deliberate abstraction and is therefore unrealistic by design. But that is also the point: a virtue of models is that they

⁵⁹ There are some exceptions to this rule. One of us, for example, has analyzed how choice-of-forum provisions across hundreds of thousands of agreements can exhibit important cross-industry trends. See generally Nyarko, *supra* note 24 (analyzing choice-of-forum provisions in a sample of half a million agreements spanning a number of industries).

focus on a limited set of core phenomena of interest, isolating them from factors that are either unrelated or less pertinent to the inquiry at hand.⁶⁰ Doing so often reveals intuitions that would otherwise be harder to discern and understand. In turn, those intuitions can be assessed against real-world data (which we proceed to do in Part III).

That said, we do not aspire to develop a formal model that is prohibitively difficult to understand—that would defeat the purpose of developing clean intuitions. Consequently, this Part presents our modeling approach and core results informally, using numerical examples where appropriate. Readers interested in a more technical characterization of the model that makes use of formal notation can find it in the Appendix.

A. The Setting

Consider a transactional setting that involves a sequence of buyer-seller pairs, each negotiating terms governing an acquisition agreement. For concreteness, suppose that exactly one contract is negotiated each day, and neither the buyer nor the seller contracts repeatedly. For each such transaction, the buyer and seller each retain sophisticated law firms to represent their interests, delegating to it the task of negotiating many of the transactional details other than price. Unlike their clients, these law firms are repeat players. To illustrate using the example of the Tiffany-LVMH merger, among the details negotiated by the law firms is an MAE provision, which determines whether and under what circumstances the buyer can walk away from the deal in the face of changed circumstances. Below is a stylized example of a typical MAE clause:

“Company Material Adverse Effect” means any effect, change, event, circumstance, or occurrence that has had or would reasonably be expected to have a material adverse effect on the seller’s business, operations, or financial condition; provided, however, that none of the following shall be taken into account in determining whether a Company Material Adverse Effect has occurred or may occur: (A) any occurrence, condition, change, event or effect resulting from or relating to changes in general economic or financial market

⁶⁰ For more on this point, see Eric Talley, *Turning Servile Opportunities to Gold: A Strategic Account of the Corporate Opportunities Doctrine*, 108 YALE L.J. 277, 310–11 (1998).

conditions; (B) any occurrence, condition, change, event or effect that affects the targets industry as a whole.

This provision is structured in such a way that many—but not all—of the important risks associated with changed circumstances are assigned to the seller. In particular, the buyer is allowed to walk away from the deal when there is a significant negative impact on the seller’s business, operations, or financial condition. However, the provision also excludes certain types of changed circumstances that do not count as an MAE, meaning that such risks are effectively borne by the buyer. In our example, the buyer is not allowed to walk away from the deal if the effect also impairs the whole economy or peer firms in the industry. These latter exclusions are popularly known as “MAE carveouts.”

To add some color, suppose that the first transaction in this sequence is negotiated in January 2020, just as news of the COVID-19 virus was beginning to spread.⁶¹ Cognizant of the nascent risk, counsel for the seller deliberates whether to propose a deviation from the standard MAE, inserting “pandemics” as an explicit MAE carveout. From the counsel’s perspective, doing so would provide considerable benefits: it maximizes the probability that the deal closes, and it assigns all the risk of a pandemic to the buyer. At the same time, however, an explicit pandemic carveout will come at a cost. First, it calls attention to the emergent hazard, which would be significant if the buyer’s counsel were not already aware of the risk. Second, counsel for the buyer would likely be unwilling to accept a pandemic carveout without extracting a buyer-friendly provision as a quid pro quo.⁶² Third, enumerating “pandemic” as an MAE carveout could have unintended consequences as to other unanticipated changes. If, say, some distinct disaster eventuates (e.g., an asteroid hitting Earth), the fact that this MAE has chosen explicitly to carve out pandemics while remaining silent on everything else may lead courts to conclude that all nonpandemic risks were intentionally excluded and

⁶¹ See, e.g., Derrick Bryson Taylor, *A Timeline of the Coronavirus Pandemic*, N.Y. TIMES (Mar. 17, 2021), <https://perma.cc/7QK8-T3WJ>.

⁶² See Albert Choi & George Triantis, *The Effect of Bargaining Power on Contract Design*, 98 VA. L. REV. 1665, 1690–91 (2012) (describing a two-stage negotiation process in which nonprice terms are negotiated after the price terms are fixed); Jeffrey Manns & Robert Anderson IV, *The Merger Agreement Myth*, 98 CORNELL L. REV. 1143, 1176 (2012) (describing that nonprice terms typically cannot be traded off against price terms).

should be treated differently.⁶³ By including an explicit pandemic carveout, then, seller's counsel might unwittingly amplify the likelihood that a court will assign other, unenumerated risks to the seller (e.g., terrorism). Given all these uncertainties, the seller's counsel may have difficulty determining the precise value of the pandemic carveout. Counsel for the buyer may be in a similar position—unsure of the magnitude of the underlying risk but possibly receptive to a pandemic exclusion if they could extract a sufficiently valuable concession in return.

B. Sequence of the Model and Informational Environment

Against this backdrop, our model envisions that a new contract term or mutation (e.g., a pandemic carveout) might require several distinct transactions to emerge. And it is here that lawyers begin to play an important role. As noted above, in each transaction a new buyer-seller pair seeks to conclude an agreement, each retaining one law firm chosen at random from a fixed population of multiple firms.⁶⁴ Once selected, the two firms negotiate over whether to retain the traditional term or to adopt the new, explicit carveout provision. Several considerations influence their final decision, including their general beliefs, the knowledge and experience that they have gained from prior deals, and their (possibly imprecise) impressions of the economics of the deal in front of them. We will detail these considerations below.

1. Composition of population.

Our model assumes that adopting the mutation is not ideal for all possible contracts. In particular, we suppose that there is a percentage of deals—denoted by z —for which a pandemic carveout would represent a net cost, effectively destroying value. Such scenarios could, for example, represent a transaction where the buyer is a superior risk bearer or where uncertainty about judicial interpretation of the term is prohibitive. For the remaining percentage of deals— $(100\% - z)$ —the new mutation would create value. Such a situation might describe scenarios in which the

⁶³ This interpretive canon, known as *eiusdem generis*, states that when there is an enumerated list of examples, such lists should be read to limit the reach of more general terms. *Ejusdem Generis*, BLACK'S LAW DICTIONARY (11th ed. 2019).

⁶⁴ In our baseline simulations, we will arbitrarily set the number of law firms to ten for expositional purposes. Our model allows the number of law firms to be set at any positive, nonzero integer.

seller is the superior risk bearer or the uncertainties about legal interpretation are low. Significantly, however, we further assume that this key proportion z is itself not known with certainty but could take on one of two profiles. For example, either (a) the population tends to favor the conventional term, such that $z = 70\%$ (and $100\% - z = 30\%$); or (b) it tends to favor the mutation with $z = 30\%$ (and $100\% - z = 70\%$). Regardless of which direction the population skews, it is clear that the mutation does not yield a uniformly positive payoff across all deals.

2. Baseline belief about composition of population.

Importantly, our model assumes that the population skew is not itself directly observable by the negotiating lawyers. In other words, lawyers do not know for certain whether the population of deals, on balance, benefits from the new mutation or not. Facing such uncertainty, the first (and most logical) starting point for them is their underlying prior belief about the population's characteristics. Because our core interest is to trace the evolution of contractual provisions in unfamiliar environments, we presume that attorneys begin with considerable confidence that the mutation is not valuable on average. Instead, they (incorrectly) believe that 70% of deals should not adopt the mutation and should instead incorporate the conventional term. In our baseline analysis, we assume that attorneys are 95% confident of this fact and that they assess only a 5% likelihood that the overall population of deals favors the mutation. Combining these facts, it follows that the parties' prior belief that a randomly selected deal is amenable to the mutation is only 32%.⁶⁵

3. Signal of the deal.

In addition to general attributes of the population, we further assume that each new deal brings with it its own information that assists the parties in determining whether the mutation is likely to generate value. For instance, as noted above, the buyer and seller themselves may be able to assess to a certain degree which party is better able to bear risk, and the pricing formulas of each deal (e.g., cash versus stock) may further suggest who the most efficient risk bearer is. The parties likely also have specific information about how susceptible their other operations are to events

⁶⁵ $0.95 \times 30\% + 0.05 \times 70\% = 32\%$.

like pandemics that have widespread impacts on the economy. To the extent that they have access to and can accurately process such information, transactional lawyers would want to incorporate it in deciding whether to adopt the mutation.

That said, the lawyers are a step removed from both the internal operations of their clients and other factors that might affect the overall value of each mutation. As a result, their deal-specific knowledge may itself be somewhat limited and not always reliable. Our model accounts for this possibility, too, by presuming that lawyers have access to a noisy “signal” of whether the specific deal before them is best adapted to the mutation. The accuracy of this signal will prove important to the lawyers’ subsequent actions.

To take one extreme example, suppose lawyers are particularly perceptive and can identify with 100% accuracy whether a deal they are negotiating is better suited for the conventional term or a new term. Here, we would not expect that other information pertaining to the population-wide distribution of deals would have any consequence. The lawyers would craft the deal in the way that is best suited to the deal in front of them. On the other end of the spectrum, suppose that the deal signal is wholly uninformative—right and wrong with equal likelihood. Here, the signal would be useless, and the parties would lean exclusively on their beliefs about what is best for the average deal in the population of all contracts.

The most realistic scenario, however, falls between those two extremes, where the signal is neither perfect nor useless. The parties, therefore, can combine it with their preexisting beliefs about the entire population of deals in order to inform their actions for the deal in front of them. As we show below, this possibility gives rise to an interesting learning dynamic in which the lawyers may be guided sometimes by their knowledge about the population and other times by their deal-specific information (and this proclivity might change over time).

4. Prior experience.

Finally, and perhaps most centrally, our model allows the transacting attorneys to engage in a form of dynamic learning through prior dealmaking. Lawyers are, after all, the pivotal repeat players in this context, and they can be expected to gain additional information about the effects and appropriateness of the

mutation as time passes. Over time, as lawyers continue to negotiate deals, they begin to amass a collection of prior signals that they observed in past transactions. That information, in turn, can buttress their knowledge and expectations as to whether, on average, it is more likely that a given mutation increases or decreases contractual surplus.

In our illustrative example, the lawyers may, over time, observe that deals incorporating a pandemic carveout appear with surprising frequency. While they perhaps would have resisted the new term for the first few deals, the increasing frequency of seemingly well-adapted deals can cause them to update their beliefs about how many deals benefit from the new term.

Given the incremental learning possibilities, our model also allows the amassed knowledge of both parties' lawyers to inform their transaction collaboratively. Here, we assume that lawyers can draw on their past experiences—in particular, signals that they have observed from prior deals—to update their beliefs regarding the prevalence of mutation-favored deals in the population. Specifically, we suppose that the lawyers negotiating each deal are able to pool their observations from prior deals to further refine, through Bayesian updating, their assessment of the overall population.⁶⁶ This assessment is then combined with the signal that they observe in the instant deal, and the parties will favor the mutation if and only if they believe that the deal in front of them is at least 50% likely to warrant the mutation.

C. Model Simulations

Having laid out the basic elements of our model, we are now in a position to demonstrate some of the ways that it may propa-

⁶⁶ See Eric L. Talley, *Law, Economics, and the Burden(s) of Proof*, in RESEARCH HANDBOOK ON THE ECONOMICS OF TORTS 305, 308 n.9 (Jennifer H. Arlen ed., 2013):

The term “Bayesian” refers to the process by which a statistically-minded decision-maker marshals available information to update her probabilistic beliefs about the world. . . . The benchmark process of updating follows what is known as “Bayes’s rule,” which states (for the case of discrete random variables) that the probability of an event A occurring, conditional on knowing that some other event B has occurred (or $Pr[A|B]$) can be derived from a combination of the respective “base rate” probabilities of A and B (or $Pr[A]$ and $Pr[B]$) and the “reverse conditional” probability that B occurs, conditional on knowing that A has occurred (or $Pr[B|A]$). These four probabilities are related to one another according to the following expression:

$$Pr[A|B] = \frac{Pr[B|A] \times Pr[A]}{Pr[B]}.$$

gate an assortment of diffusion patterns. We begin by briefly illustrating and discussing the roles of several of our parameters on the diffusion pattern. We believe that this exercise yields intuitive yet important insights into how mutations might diffuse in practice. In a second step, we will consider special cases of diffusion patterns.

Table 1 describes the core elements of our model, both in plain English (column 2) and in terms of mathematical parameters (column 3). When a parameter is involved, we also specify the value that we assign to it in our baseline analysis (column 4). For instance, the first row in Table 1 suggests that we denote the number of law firms with the symbol N and that we set it to ten. This means that, in our baseline model, the parties choose from a pool of ten law firms.

To develop intuitions about the diffusion paths, we use the parameter values from Table 1 to simulate a series of two thousand sequential deals (“rounds”), each of which follows the process described above. Because each simulation sequence evolves probabilistically, it need not always follow the same path when simulated multiple times. We therefore repeatedly run the two-thousand-round simulations in order to assess the average tendencies of the diffusion paths over time. In all the simulation diagrams below, we have rerun (iterated) the simulation one hundred separate times.

TABLE 1: KEY PARAMETERS FOR TERM EVOLUTION SIMULATIONS
(BENCHMARK CASE)

Step	Description	Parameter	Benchmark Value
1	A one-shot buyer and a one-shot seller choose their counsel from a pool of repeat-play law firms	Number of Law firms = N	$N = 10$
2	The lawyers negotiate the adoption of either a conventional term or a mutation. A fraction of all deals favors the conventional term and the remainder favor the mutation	Fraction of deals favoring the conventional term = z ; Proportion favoring the mutation = $1 - z$	$z = 0.3$ (or 30%)

3	The lawyers share prior beliefs that the population is, on balance, best adapted to the mutation	Prior beliefs = r_0	$r_0 = 0.05$ (or 5%)
4	The lawyers assess whether the specific deal in front of them is best adapted to the mutation or the conventional term	Accuracy of the inference by the lawyers = γ	$\gamma = 0.6$ (or 60%)

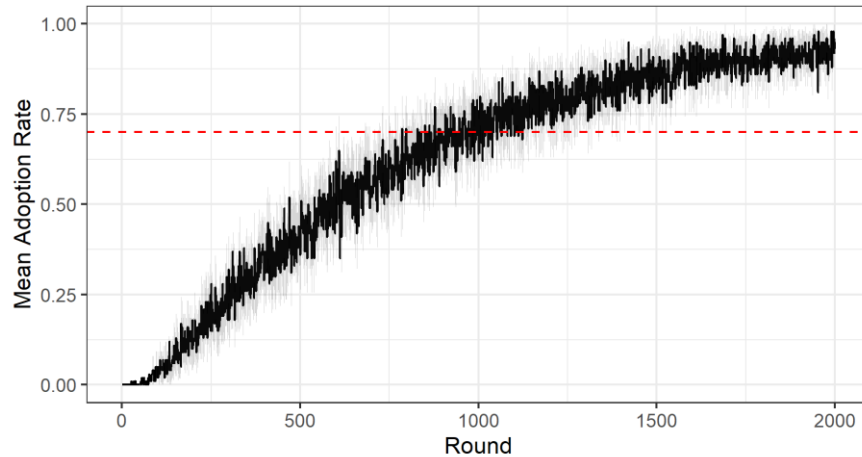
1. The benchmark case.

As described above, our benchmark model fixes the various parameter values at $z = 0.3$, $r_0 = 0.05$, $\gamma = 0.6$. This set of baseline parameters is tantamount to assuming that the adoption of the mutation is value enhancing in 70% of deals but that law firms have a strong prior belief that the mutation is, on balance, value decreasing.

As can be seen in Figure 1, lawyers are initially hesitant to adopt the mutation term. But over time, they build experience and begin to adopt the mutation, although the rate of adoption is gradual. As time progresses, the adoption rate converges to 100%, and the mutation displaces the conventional term to become dominant.

FIGURE 1: BENCHMARK SIMULATIONS

$N = 10, r_0 = 0.05, \gamma = 0.6, z = 0.3$



It is worth noting from this benchmark simulation that the mutation is not simply successful in diffusing the market, but it

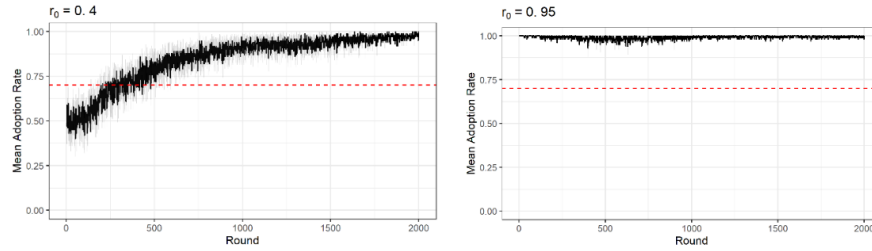
is *too* successful in some ways. Although the majority of deals (70%) are well adapted to the mutation, it visits a loss for 30% of them. In this sense, the collective embrace of the mutation overshoots the first-best rate of 70% adoption. The reason for this overshooting is simple: in our baseline simulations, lawyers are not particularly skilled at discerning deal-specific information; the signal that they observe is only 60% accurate, meaning that they have only modest confidence in their ability to diagnose the specific deal in front of them. In an environment of such contract-specific uncertainty, lawyers eventually lean more on their population-wide knowledge, embracing an imperfect, one-size-fits-all approach. Since prior experience suggests that the mutation has been, on average, value enhancing in the past, law firms ultimately opt to adopt it in all of their deals.

2. The strength of the prior belief (r_0).

Another key factor in the diffusion path is what belief the lawyers initially held. In our benchmark case, we assume that they start out believing strongly (but incorrectly) that the mutation is, on average, value decreasing. It is only over time that they amend those beliefs. In Figure 2, we consider two alternatives. In the first, we fix $r_0 = 40\%$, so that the lawyers only have a weak belief that the mutation is value decreasing. In the second, we fix $r_0 = 95\%$, corresponding to a strong belief that the adoption is value increasing.

Clearly, prior beliefs strongly influence the diffusion pattern. If prior beliefs are weak ($r_0 = 40\%$, per the left panel), lawyers will be less inclined to stick with the conventional term and quicker to adopt the new mutation relative to the benchmark case. Although this point might seem intuitive, we believe that it is still an important finding. After all, out in the real world, law firms can vary dramatically in expertise. Law firms that are relatively less comfortable in assessing a legal field likely have weaker priors and would thus be more likely to embrace a new mutation. In contrast, specialists (e.g., boutique firms) may have particularly strong priors. Our model suggests that these strong priors can also come with a decreased willingness to adopt contractual innovations.

FIGURE 2: ALTERNATIVE PRIOR BELIEFS

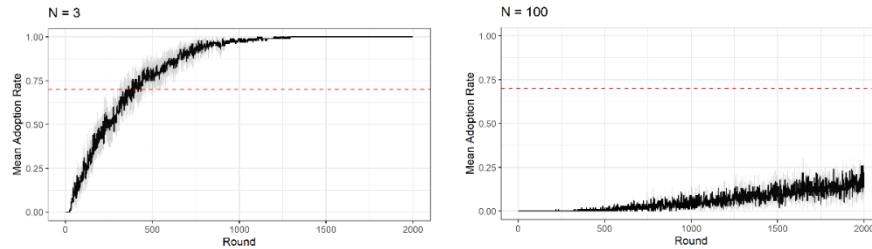


When lawyers' prior beliefs more closely correspond to the "ground truth" that the mutation is value enhancing on average ($r_0 = 95\%$, per the right panel), the convergence is nearly automatic: they will initially adopt the term immediately and generally continue on that path.

3. The number of law firms (N).

Another key factor in understanding diffusion paths is the size of the law-firm market. In our benchmark simulations, we assumed that the parties randomly choose from $N = 10$ law firms. We vary this assumption in Figure 3, where we consider the alternative cases of a small market ($N = 3$, left panel) and a large market ($N = 100$, right panel).

FIGURE 3: ALTERING THE NUMBER OF LAW FIRMS



As is clear from Figure 3, smaller markets lead to faster adoption, while larger markets dampen diffusion. The reason is very much tied to the key attribute of learning in our diffusion model—prior experience. Varying the number of law firms implicitly adjusts the frequency with which each individual law firm is able to gain experience. For instance, in the left panel ($N = 3$), each law firm will, on average, negotiate one of every three deals. This allows the lawyers to quickly accumulate experience with the specific type of deal in front of them. Because experience plays

a significant role in the learning process, accumulating more experience allows the firms to more quickly learn that the mutation is value enhancing. In contrast, with ($N = 100$), each law firm will, on average, negotiate only one in one hundred deals, making it difficult to accumulate significant experience.

We believe that this insight has important implications in practice. It suggests that adoption of a mutation can occur at a much greater pace in highly concentrated industries where legal services are provided by a handful of firms than in cases where the provision of legal services is highly dispersed. A corollary to this proposition is that large law firms attracting a lot of business can obtain a competitive advantage in their drafting practices. Indeed, it has often been asked whether large law firms provide any distinct economic value to their clients that cannot be obtained equally by other, smaller players. A study by Professor Elisabeth de Fontenay points out that one advantage of hiring such firms could be their accumulated expertise and precision in pricing deals.⁶⁷ Our findings formalize and add to those of de Fontenay. In particular, we show formally that, through repeat interaction, large firms may be better positioned to identify promising mutations in contractual language and to differentiate between those that increase the surplus for their clients and those that decrease the surplus. We highlight, however, that this effect could be counteracted if large firms hold particularly strong and incorrect beliefs about the value proposition of a mutation.

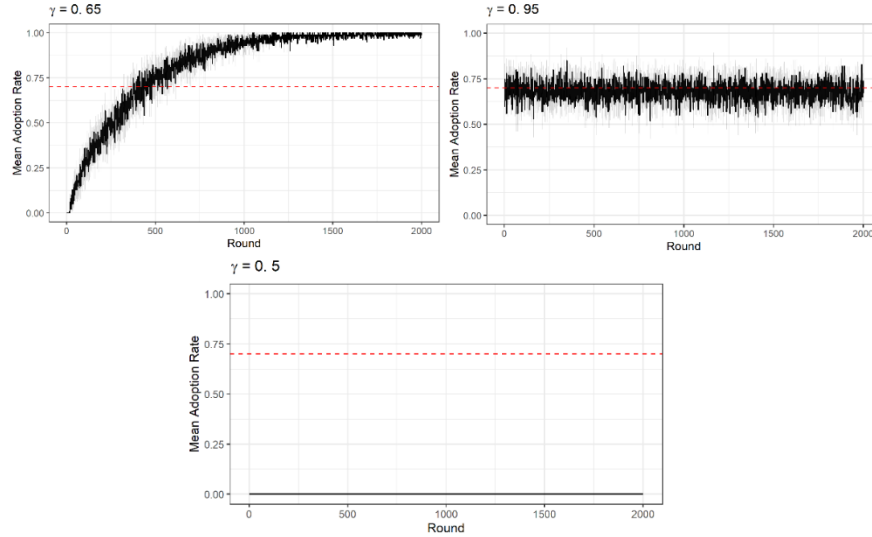
4. The accuracy of the signal (γ).

Another determinant of diffusion paths is the expertise of the lawyer, proxied by the precision of attorneys' signals about the deal in front of them. Our baseline model assumed that the signal received from each deal, while more accurate than not, is relatively noisy ($\gamma = 60\%$). In Figure 4, we examine several alternatives. First (upper left panel), we adjust this precision upward to $\gamma = 65\%$, which assumes that the signal is slightly more accurate than the benchmark. We then set $\gamma = 95\%$, which assumes that the signal is highly accurate (upper right panel). In a last step, we consider the special case of $\gamma = 50\%$, which suggests that the signal is essentially random noise and that nothing can be

⁶⁷ See Elisabeth de Fontenay, *Law Firm Selection and the Value of Transactional Lawyering*, 41 J. CORP. L. 393, 396 (2015).

learned from the signals observed in current or prior deals (lower panel).

FIGURE 4: ALTERING THE SIGNAL'S PRECISION



Note that a slight increase in signal precision (upper left panel) enhances the pace at which the mutation is adopted. We believe that this is intuitive. As the signal becomes more accurate, parties can learn about the population more quickly. That said, the pattern when signal precision is very high (upper right panel) looks markedly different. Rather than converging to an adoption rate of 100%, the adoption rate is close to the first-best efficient adoption rate of 70%. To understand this result, recall that a high signal precision means that the lawyers have very good information about the deal in front of them.⁶⁸ Here, the signal from the deal is accurate enough to make obsolete any population-wide information that the parties have, no matter how accurate. When, in contrast, the signal's precision stays below the overall population proportions (such as 65%), the signal is not as diagnostic as good information about the overall population ratio (here, 70%). Consequently, the latter information eventually controls the adoption decision.

Finally, for completely uninformative signals (bottom panel), no learning is possible. Here, the mean adoption rate is a flat line

⁶⁸ The mean adoption rate is not exactly at the efficient level of 70%; it is slightly below it. This is because lawyers still have a strong prior that the mutation is value decreasing.

at zero, indicating that law firms do not even experiment with adopting the mutation. This makes intuitive sense, since the signal is random noise in this scenario. With nothing to learn from current or prior signals, lawyers in each round tether their decisions to their prior beliefs about the population.

5. Special cases.

In addition to changing the parameters of our benchmark simulations, we also analyze diffusion patterns under the assumption that there are several shocks to the transactional environment and ask how the adoption patterns change after the shock. Although several such shocks are conceivable, we concentrate on two: regime shocks and information shocks.

a) Regime shocks. A regime shock refers to a scenario in which there is a sudden, population-wide shift in a mutation's net costs and benefits. In our example, such a shock may take the form of a sudden arrival of vaccines or herd immunity, which alter the value of including a pandemic exclusion in the contract.⁶⁹ Alternatively, a regime shock might result from a new judicial decision or other source of law that establishes how a mutation is interpreted by courts.⁷⁰

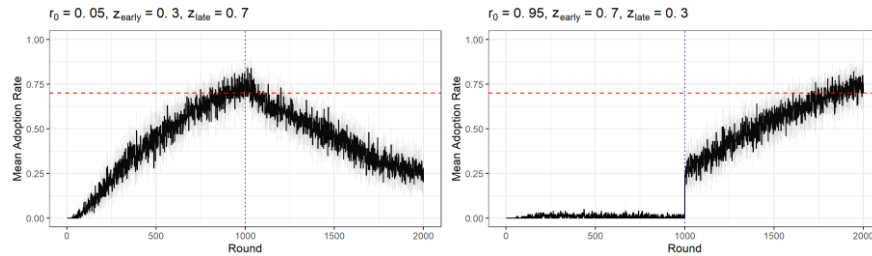
Figure 5 depicts two different types of regime shocks. In the first (left) panel, we introduce a shock in the one-thousandth round that changes the proportion of deals favoring the conventional term z from 30% to 70%. We assume that parties slowly update their beliefs, which is a finding consistent with observations in the literature on how contractual parties sometimes react

⁶⁹ Another particularly visible example (and one that we study empirically below) pertains to so-called Weinstein or #MeToo representations in M&A deals. Through these provisions, sellers guarantee that, to their knowledge, key employees are not involved in any litigation or investigation alleging sexual misconduct or abuse. See Grace Maral Burnett, *#MeToo Reps Becoming M&A Market Standard*, BLOOMBERG L. (June 25, 2019), <https://perma.cc/8JNM-E67T>. While it was traditionally assumed that #MeToo representations were largely unimportant, the sexual-abuse scandal surrounding Harvey Weinstein drastically increased the negative consequences for a company to be subject to such litigation. As such, the number of deals for which a #MeToo representation could be value enhancing increased dramatically and suddenly.

⁷⁰ For instance, whereas parties under the “doing business” test traditionally enjoyed relatively great flexibility in choosing their preferred litigation forum, a series of Supreme Court decisions starting in 2011 introduced the “essentially at home test” under which a company could be sued only in their principal place of business or their state of incorporation. See generally *Goodyear Dunlop Tires Operations, S. A. v. Brown*, 564 U.S. 915 (2011); *Daimler AG v. Bauman*, 571 U.S. 117 (2014). Arguably, this shock increased the value of choice-of-forum provisions, in turn altering the underlying proportion of contracts for which the adoption of a choice-of-forum provision is value enhancing.

to a change in precedent.⁷¹ In the second scenario, we consider the opposite regime shift, where the proportion of deals favoring the convention changes from 70% to 30%. Here, we assume that the regime change is immediately observable, an assumption consistent with regime changes induced by highly publicized events.

FIGURE 5: REGIME SHOCKS



From both simulations, it is clear that parties begin to adjust their behavior when the shock occurs. In the left panel, a growing trend toward adoption suddenly changes course, and parties increasingly reject the mutation as they observe more transactions poorly adapted to it. In the right panel, the lawyers initially stick with the conventional term while it is dominant, but they quickly adopt the mutation when a mutation-favoring shock occurs. As mentioned above, there is an initial and immediate increase in the adoption rate because we assume that the lawyers directly observe the change in the population, whereas in the simulation to the left, they learn about the full extent of the shift over time.

These simulations demonstrate the importance of the underlying environment that generates each deal. As that environment changes, we see gradual adaptation to the new regime by parties through learning. That said, in both scenarios, the eventual diffusion pattern that takes hold has the effect of overshooting the true population composition. Attorneys thus use their deal-specific information to adjust their overall expectations, but, over time, they tend to set it aside with individual contracts, emulating the emergent norm.

⁷¹ See Nyarko, *supra* note 24, at 24 (suggesting that the use of templates may slow down the pace of adoption); Kahan & Klausner, *supra* note 38, at 727–28 (arguing that network effects may induce some amount of stickiness); GULATI & SCOTT, *supra* note 39, at 33–45 (finding that, in the context of the *pari passu* clause, lawyers were slow to adapt drafting practices to a novel judicial interpretation of the provision).

b) Information shocks. A second type of shock is a shock not to the underlying contracting environment but rather to information. In the benchmark case, we assumed that deal experience generates substantially private information for law firms. In other words, the knowledge that each firm acquired in prior transactions was not generally disclosed publicly; at most, it was shared with the contractual partner in their current deal. This is often a reasonable assumption because rules of professional conduct and private reputation-building incentives would both tend to induce lawyers to keep client-specific information close to their chests.⁷²

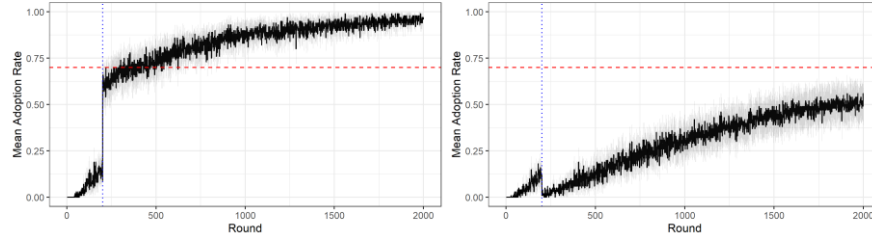
That said, in certain contexts, private information is pooled effectively for public consumption. For instance, in the M&A industry, the American Bar Association (ABA) conducts deal points studies at regular intervals. For these studies, the ABA collects information from merger agreements that parties have previously disclosed to the SEC. The ABA then shares this information, including current trends in the adoption of certain contractual provisions, with the industry at large.⁷³ Other examples of information pooling can be found in academic studies that examine contractual practices. The release of information can create information shocks, during which the private deal making practices of law firms become public knowledge.

We can incorporate information shocks and demonstrate their effects on diffusion patterns within our model. Figure 6 does this: In the two-hundredth round, we assume that all law firms receive credible information about the adoption pattern in all prior rounds. These firms then run internal simulations to assess what diffusion path would have looked like if $z = 30\%$ and what it would have looked like if $z = 70\%$. Next, they compare the diffusion path of their internal simulation to the observed diffusion path. They then update their beliefs based on the relative likelihood that the observed path would have emerged in each scenario. After making this determination, they update their baseline prior belief to incorporate all signals contained in the information-pooling event.

⁷² See MODEL RULES OF PRO. CONDUCT r. 1.6 (AM. BAR ASS'N 2021).

⁷³ See Jessica C. Pearlman & Tatjana Paterno, *Announcing the ABA's 2019 Private Target Mergers & Acquisitions Deal Points Study*, A.B.A. (Jan. 14, 2020), https://www.americanbar.org/groups/business_law/publications/blt/2020/01/deal-points.

FIGURE 6: INFORMATION DUMPS



In the left panel of Figure 6, the information that is released to the public about contract practices is accurate. To illustrate, this scenario emulates the release of a deal points study that indicates whether other drafters believe that their deals benefit from the mutation. It also publicizes who has chosen to adopt the mutation so far. As can be seen, the intervention suddenly and significantly increases the adoption rate. This is because lawyers more quickly learn that many of them received the signal that the adoption of the mutation is value enhancing. They thus more quickly realize that, on average, it is beneficial to adopt the mutation.

In contrast, in the right panel, we assume that the information shock releases inaccurate information. One can imagine several reasons for why this might happen. Most events that seek to update lawyers on contract-drafting practices are inherently limited in the sample they can draw from. For instance, the most comprehensive contracts database is the SEC's EDGAR database. In it, interested parties can find material contracts concluded by publicly registered companies. However, many types of transactions are not represented. For instance, neither deals between private companies nor those involving smaller stakes can be found. Another potential reason for inaccurate information shocks is that those who seek to pool information might limit their sample size (e.g., by including only M&A transactions that exceed \$100 million). If skewed samples incorrectly represent the entire population of deals, there is the danger that parties may draw incorrect inferences from the pooling intervention.

As shown right panel, such incorrect pooling of information generally delays the adoption of a mutation. However, absent extraordinary circumstances,⁷⁴ parties will eventually accumulate

⁷⁴ An example of an extraordinary circumstance would be if r_0 takes the extreme value of 0 or 1.

sufficient representative signals in their own practice to overcome the incorrect inference that they drew from the pooling event. This is significant because it suggests that, although incorrect information causes some harm to the adoption practice, drafters' experience ultimately prevails.

III. AN ASSORTMENT OF DIFFUSION PATHS IN THE M&A MARKET

One of the useful attributes of simulating the outcome of diffusion patterns under our model is that it allows us to form intuitions about how to interpret patterns of diffusion that we see in the real world. How well does the above analysis capture these practices? In this Part, we turn to real-world data of contractual evolution in the M&A market. Specifically, we focus on a collection of 2,141 M&A deals in excess of \$100 million signed between 2000 and 2020. We ask whether their diffusion pathways appear to resemble those identified in our model and simulations. In doing so, we again note that it should not be expected that any real-world diffusion pattern maps exactly onto the patterns observed during our simulations. As we highlight above, our model is an abstraction, leading to much cleaner observations than can be found in complex real-world data sets. As such, the evidence presented in this Part should be considered suggestive rather than determinative.

When assessed against the backdrop of our model, real-world practices display trends that enable us to determine possible contributors to diffusion and diagnose the normative desirability of the observed trends. Perhaps most importantly, we find that the merger-agreement provisions that we study do not all follow a single evolutionary trajectory. Rather, our analysis finds that some practices appear to follow one simulation pattern, while others follow a different one. From this comparison, we conclude that the contractual evolution in the M&A market is far from homogenous.⁷⁵

Merger agreements are rich in dimensionality, typically containing a great number of provisions spanning dozens (if not hundreds) of pages.⁷⁶ We focus here on a discrete subset of notable terms: (1) pandemic-related force majeure provisions,

⁷⁵ See generally Jennejohn, *supra* note 54 (finding evidence of diversity in a collection of terms in M&A agreements from one large corporate law firm).

⁷⁶ See John C. Coates IV, *Why Have M&A Contracts Grown? Evidence from Twenty Years of Deals* 8–12 (ECGI Law Working Paper No. 333, 2016), <https://perma.cc/89UY-UFF9>.

(2) Committee on Foreign Investment in the United States (CFIUS) provisions, (3) reverse termination fees, (4) #MeToo (Weinstein) provisions, (5) top-up options, and (6) choice-of-law and -forum provisions. For the M&A specialist, these terms will be quite familiar. Just as important, this list includes terms that have been described by other observers over the last few decades as exemplars of diffusion, mutation, and evolution.

In the sections below, we consider whether and how the reception of each term matches up with our modeling predictions. Each of the following sections first provides a brief description of a notable term, then illustrates the actual dynamic diffusion pattern of each such term over the last two decades. To formulate these actual diffusion patterns, we draw on a substantial database of 2,141 hand-collected and -labeled merger agreements spanning nearly two decades.⁷⁷

Before continuing, we emphasize that our main aspiration in this Part is to empirically illustrate the existence of the different diffusion patterns captured by our theoretical model. This exercise is an important step for assessing whether the distinct paths predicted by our theoretical framework have real-world analogues. At the same time, the empirical evidence highlighted below is not meant to serve as a formal validation of our model. To do that, it would be necessary to recover the deep parameters of our model and then undertake testing to see whether dynamics evolve in a manner predicted. Such an enterprise would involve marshaling a host of subjective and arbitrary decisions, requiring multiple robustness checks to be convincing. Although we close this Part with a brief overview of how a more rigorous empirical implementation would play out,⁷⁸ we concentrate below on intuitive illustrations.

A. MAEs and Pandemic Carveouts

The MAE or Material Adverse Change (MAC) provision is a staple of any M&A transaction. It is used to allocate risk and pro-

⁷⁷ We collected all publicly available M&A contracts for deals between 2000 and the first half of 2020 that were valued above \$100 million. We then labeled these contracts according to whether they included certain provisions.

⁷⁸ See *infra* Part III.G (providing an overview of how a more technical and rigorous empirical implementation would play out).

vide grounds for terminating a deal in the event that certain unforeseen circumstances occur.⁷⁹ The basic MAE provision defines the MAE (somewhat circularly) as “any event, circumstance, development, or condition occurring that has already had, or would be reasonably expected to have, a[n] [MAE] on the target.”⁸⁰ This language is then typically followed by a list of carveouts or exceptions that—withstanding the foregoing language—would not constitute an MAE. That is, these enumerated events would not constitute sufficient grounds for termination. Carveouts can be general (e.g., general macroeconomic or governmental events) or specific (e.g., natural disasters, climate change, and other industry-specific risks).⁸¹ Finally, the MAE might also provide exceptions to the exceptions (sometimes called “carve ins”), stating that the MAE exceptions could still constitute an MAE if, for instance, an event has a disproportionate impact on the seller as compared to other companies in the seller’s industry.⁸²

Generally, the term “material” in an MAE provision is not defined,⁸³ so guidance on what actually constitutes an MAE sufficient to justify termination of a deal comes almost entirely from

⁷⁹ Due to its importance, the modern MAE provision has become the subject of many conceptual and empirical studies in recent years. *See generally, e.g.*, Ronald J. Gilson & Alan Schwartz, *Understanding MACs: Moral Hazard in Acquisitions*, 21 J.L., ECON. & ORG. 330 (2005); Eric L. Talley, *On Uncertainty, Ambiguity, and Contractual Conditions*, 34 DEL. J. CORP. L. 755 (2009); Robert T. Miller, *The Economics of Deal Risk: Allocating Risk Through MAC Clauses in Business Combination Agreements*, 50 WM. & MARY L. REV. 2007 (2009); Robert T. Miller, *Canceling the Deal: Two Models of Material Adverse Change Clauses in Business Combination Agreements*, 31 CARDOZO L. REV. 99 (2009); Andrew A. Schwartz, *A Standard Clause Analysis of the Frustration Doctrine and the Material Adverse Change Clause*, 57 UCLA L. REV. 789 (2010); Eric Talley & Drew O’Kane, *The Measure of a MAC: A Machine-Learning Protocol for Analyzing Force Majeure Clauses in M&A Agreements*, 168 J. INSTITUTIONAL & THEORETICAL ECON. 181 (2012); David J. Denis & Antonio J. Macias, *Material Adverse Change Clauses and Acquisition Dynamics*, 48 J. FIN. & QUANT. ANALYSIS 819 (2013); Antonio J. Macias & Thomas Moeller, *Target Signaling with Material Adverse Change Clauses in Merger Agreements*, 39 J. EMPIRICAL FIN. 69 (2016). The term, which once attracted primarily U.S.-focused commentary, is now also taking on international dimensions. *See generally, e.g.*, Narine Lalafaryan, *Material Adverse Change Uncertainty: Costing a Fortune If Not Corporate Lives*, 21 J. CORP. L. STUD. 39 (2020).

⁸⁰ Andrew L. Burnstine & Perry F. Sofferman, *COVID-19’s Impact on the M&A Market: Measures and Precautions*, DAILY BUS. REV. (July 10, 2020), <https://www.law.com/dailybusinessreview/2020/07/10/covid-19s-impact-on-the-ma-market-measures-and-precautions>.

⁸¹ *See* Bryan Monson, Note, *The Modern MAC: Allocating Deal Risk in the Post-IBP v. Tyson World*, 88 S. CAL. L. REV. 769, 774 (2015).

⁸² *Id.* at 793.

⁸³ *Id.* at 773.

the courts. In 2001, *In re IBP Shareholders' Litigation*⁸⁴ provided the now-standard interpretation of MAE clauses, reading the provision as incredibly seller-friendly and making three important holdings: “First, the court held that a general economic or industry decline . . . could not alone constitute a MAC. Instead, the purchaser must show that the event had the ‘required materiality of effect’ on the target.”⁸⁵ “Second, the court held that contractual language . . . must be interpreted in light of the ‘negotiating realities’ and larger context in which the parties were contracting,”⁸⁶ further noting the difference between financial and strategic buyers in an MAE context.⁸⁷ Third, the court noted that “the decision ultimately boiled down to a question of public policy . . . [that] would likely require the purchaser to make a strong showing before allowing it to invoke a MAC exception to its obligation to close.”⁸⁸ Indeed, the Delaware Court of Chancery in *In re IBP* declined to find that an MAE had occurred.⁸⁹ In that respect, the case was a harbinger: buyers’ attempts to argue that an MAE had occurred in subsequent cases would regularly founder on the shoals of *In re IBP*’s rigorous standard.⁹⁰ It was not until 2018 that the Delaware Chancery Court sided with a regretful buyer’s claim that an MAE had indeed occurred, permitting the buyer to terminate the deal on those grounds.⁹¹

While the basic structure of MAE provisions has remained essentially standardized since the 1970s,⁹² certain events have

⁸⁴ 789 A.2d 14 (Del. Ch. 2001).

⁸⁵ Monson, *supra* note 81, at 779 (quoting *In re IBP*, 789 A.2d at 66).

⁸⁶ *Id.* (quoting *In re IBP*, 789 A.2d at 67).

⁸⁷ When litigation concerns a financial buyer, it’s more likely that a short-term issue could be a MAC, whereas a strategic buyer looking to acquire the company for reasons not purely financial would be less likely to succeed in classifying a short-term dip in earnings potential as an MAE. Vice Chancellor Leo Strine opined on the difference between financial and strategic buyers in *In re IBP*, stating that “[i]t is odd to think that a strategic buyer would view a short-term blip in earnings as material, so long as the target’s earnings-generating potential is not materially affected by that blip or the blip’s cause.” 789 A.2d at 67.

⁸⁸ Monson, *supra* note 81, at 779 (citing *In re IBP*, 789 A.2d at 68).

⁸⁹ *In re IBP*, 789 A.2d at 65–68.

⁹⁰ See generally, e.g., *Newmont Mining Corp. v. AngloGold Ashanti Ltd.*, No. 17-CV-8065, 2020 WL 1285543 (S.D.N.Y. Mar. 18, 2020); *Channel Medsystems v. Bos. Sci.*, No. 2018-673, 2019 WL 6896462 (Del. Ch. Dec. 18, 2019); *Hexion Specialty Chems., Inc. v. Huntsman Corp.*, 965 A.2d 715 (Del. Ch. 2008); *Frontier Oil Corp. v. Holly Corp.*, No. Civ. A. 20502, 2005 WL 1039027 (Del. Ch. Apr. 29, 2005).

⁹¹ *Akorn, Inc. v. Fresenius Kabi AG*, No. 2018-300, 2018 WL 4719347, at *101 (Del. Ch. Oct. 1, 2018).

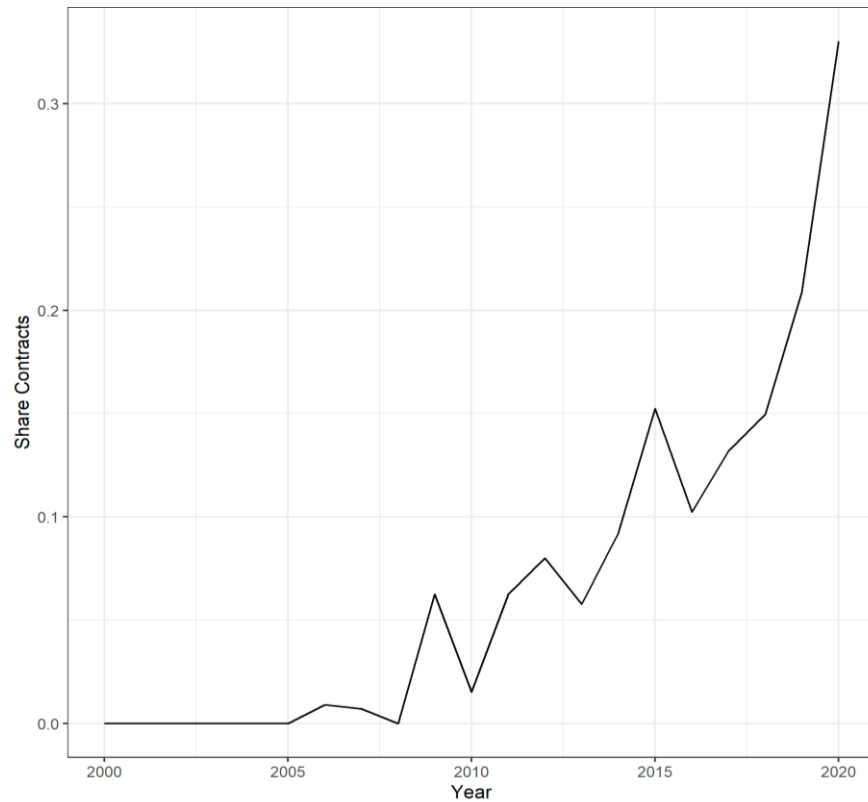
⁹² See Monson, *supra* note 81, at 773.

the potential to significantly and permanently impact MAE provisions. For example, early MAE provisions excluded any mention of national-security-related risks; now, terrorism is included in almost every MAE's list of carveouts.⁹³ The COVID-19 pandemic has the potential to be another such permanent change to the MAE formula. (Though recall that the LVMH–Tiffany deal did not specifically invoke pandemics as a carveout even though it specifically mentioned other explicit types of hazards.)

Figure 7 illustrates the dynamic adoption of pandemic-specific carveouts in MAE provisions. To qualify, we require that the carveout explicitly make reference to a pandemic, disease, public-health crisis, or something similar. Such carveouts were virtually nonexistent prior to the 2009 H1N1 outbreak, though a small number of provisions attended the earlier SARS and MERS outbreaks outside of the United States. With H1N1, however, the genuine possibility of pandemic-related risks appeared to become more salient; accordingly, carveouts began to appear in an increasing number of deals. Toward the end of 2019, and particularly throughout 2020, pandemic-specific carveouts became more popular, appearing in over a third of announced deals. All indications suggest that the popularity of such carveouts will continue to accelerate.

⁹³ See *id.* at 774.

FIGURE 7: PANDEMIC CARVEOUTS OVER TIME



The largely monotonic and increasingly steep rise of pandemic-related carveouts is suggestive of our benchmark case: parties begin with a low assessment of pandemic relevance and then reassess the underlying nature of the population of deals, increasingly incorporating pandemic carveouts into their successive transactions. Note, however, that the change does not appear to have been discontinuous, as one might have seen if, for example, a regime shock suddenly enabled attorneys to read the situation more effectively. This pattern, therefore, seems to have many of the markings of a learning process in which succeeding generations of deals create momentum for subsequent adoptions. It is perhaps still too early to diagnose whether the diffusion pattern will ultimately overshoot the fraction of deals that might warrant a pandemic carveout, so only time will tell whether the current trend ultimately recedes before adoption becomes ubiquitous.

B. CFIUS Regulatory Covenants

A second branch of potential diffusion patterns is regulatory covenants in M&A deals. These terms typically address the broad range of contingencies that can be vitally important to the deal's closing. The most familiar example is found in many large strategic acquisitions, which often allocate risks associated with obtaining antitrust approval from the Federal Trade Commission (FTC) or the Department of Justice's (DOJ) Antitrust Division.⁹⁴ Companies operating in certain industries, such as banking or electrical utilities, also require approval from the relevant regulatory agencies.⁹⁵ In most cases, the buyer will bear the regulatory risk and be bound by an efforts standard—typically, “best efforts,” “reasonable best efforts,” or “commercially reasonable efforts”—to address a regulator's anxieties about the transaction.⁹⁶ Standard efforts language appears in most deals related to regulatory risks and requirements, usually stopping short of the most extreme standard, “hell or highwater,”⁹⁷ which places all the non-closing risk on the buyer, requiring her to do what is necessary to make the deal close—i.e., agreeing to whatever remedial measures the agency demands.

Cross-border transactional lawyers have recently begun to pay particularly close attention to international regulatory approvals related to foreign direct investment. CFIUS, tasked with reviewing transactions “which could result in foreign control of any person engaged in interstate commerce in the United States,”⁹⁸ has become relevant enough that “U.S. companies considering any level of foreign investment must have CFIUS on

⁹⁴ The review of mergers for potential anticompetitive effects is undertaken by both the FTC and the DOJ's Antitrust Division in a dual regulatory system. See generally Philip J. Weiser, *Reexamining the Legacy of Dual Regulation: Reforming Dual Merger Review by the DOJ and the FCC*, 61 FED. COMM'NS L.J. 167 (2008).

⁹⁵ See generally Jeremy C. Kress, *Modernizing Bank Merger Review*, 37 YALE J. ON REG. 435 (2020); Milton A. Marquis, *DOJ, FTC and FERC Electric Power Merger Enforcement: Are There Too Many Cooks in the Merger Review Kitchen?*, 33 LOY. U. CHI. L.J. 783 (2002).

⁹⁶ Matthew Jennejohn, *Innovation and the Institutional Design of Merger Control*, 41 J. CORP. L. 167, 201–02 (2015) (situating parties' efforts obligations within a broader contractual allocation of uncertainty between the merging parties).

⁹⁷ “Hell or highwater” language, which essentially corners the buyer into closing the deal no matter the cost, was used in less than 5% of deals surveyed. For a discussion of effort-standard language, see Fang Xue, Yuefan Wang & Qi Yue, *Recent Trends and Issues in Outbound Acquisitions by Chinese Companies*, 20 M&A LAW. Nov./Dec. 2016, at 1, 3.

⁹⁸ 50 U.S.C. app. § 2170(a).

their radar.”⁹⁹ CFIUS has the power to recommend to the president one of three courses of action: block, clear, or require mitigation measures to be imposed on the transaction. These options translate into opposing language by the buyer and seller: Sellers, seeking closing assurances, want to prevent buyers from choosing to walk away from a deal rather than complying with CFIUS’s mitigation measures.¹⁰⁰ Buyers, looking to preserve the option to walk away for precisely that reason, seek language eliminating liability in the event that CFIUS approval cannot be obtained.¹⁰¹

A complicated combination of factors influences parties’ uses of regulatory-risk-allocation language in their merger agreements. On one hand, the intensity of regulatory review has been increasing. In 2018, Congress passed the Foreign Investment Risk Review Modernization Act of 2018¹⁰² (FIRRMA), significantly expanding CFIUS’s jurisdiction. Additionally, CFIUS provisions may change based on the growing categories of deals subjected to CFIUS review, particularly as the agency’s reach has been significantly expanded. For example, the share of transactions that were subjected to CFIUS review rose from 26% to 46% between 2014 and 2017.¹⁰³ The new FIRRMA regulations finalized in January 2020 promise to further change the population of CFIUS-reviewed companies by widening the agency’s net to capture a much larger portion of the technology, insurance,¹⁰⁴ and

⁹⁹ MP McQueen, *CFIUS Annual Report Shows Big Jump in Investigations*, N.Y.L.J. (Nov. 22, 2019), archived at <https://perma.cc/P385-MU88>. McQueen reports that from 2014 through 2017, the number of investigations rose 237%. The growth appears to be more concentrated on the back end: the percentage of transactions subjected to mitigation steps was less than 10% per year between 2008 and 2015 but reached almost 20% in 2017. Additionally, the percentage of transactions subjected to the agency’s forty-five-day investigation process (rather than being cleared or blocked after the thirty-day review period) rose from 46% in 2015 to 70% in 2017, with both numbers “far above the percentages in most prior years.” *CFIUS Taking a Larger Role in Inbound M&A*, BAIRD (May 23, 2018), <https://perma.cc/D2MS-FVWV>.

¹⁰⁰ Sellers often negotiate for “best efforts,” “reasonable best efforts,” or “commercially reasonable efforts” language related to the buyer’s obligations seeking approval, often including language stating that the buyer “agrees not to withhold unreasonably any consent to any mitigation or other requirements imposed by CFIUS in connection with the CFIUS [f]iling.” MARGARET GATTI, STEPHEN PAUL MAHINKA & CARL VALENSTEIN, MORGAN LEWIS, CFIUS: THE INCREASING IMPORTANCE OF NATIONAL SECURITY REVIEWS IN M&A TRANSACTIONS 37 (2016).

¹⁰¹ Buy-side negotiators seek language confirming that “the [b]uyer shall not be required to agree to any mitigation or other requirements as a condition of approval.” *Id.*

¹⁰² Pub. L. No. 115-232, § 1701, 132 Stat. 2174 (2018).

¹⁰³ See McQueen, *supra* note 99.

¹⁰⁴ For a discussion of the impact of the new CFIUS amendments on the insurance sector, see Nicholas Klein, Gabriel Gershowitz & Prakash (PK) Paran, *Insurance Sector*

real estate sectors. Currently of note is the possibility that “the [COVID-19] pandemic may prompt CFIUS to examine health care sector transactions more closely than before,”¹⁰⁵ expanding CFIUS’s real-world application in addition to its jurisdiction.¹⁰⁶

On the other hand, the increased intensity of CFIUS review is not felt uniformly across the market. Chinese investors have been hit particularly hard, for instance. In 2016, due to regulatory concerns, “Chinese buyers complete[d] just 67% of announced out-bound deals.”¹⁰⁷ In a further interesting twist, Chinese investors have been offering a “China premium” instead of agreeing to seller-friendly regulatory covenants in order to compensate for the heightened regulatory risk, meaning that the investor increases their purchase-price offer to compensate for the potential regulatory hurdles.¹⁰⁸ Many sellers prefer such a premium to contractual risk allocation because many Chinese buyers are outside the jurisdiction of necessary enforcement mechanisms and are unwilling to subject themselves to extrajudicial enforcement options.¹⁰⁹

Finally, after *Ralls Corp. v. Committee on Foreign Investment*,¹¹⁰ a 2014 case in which the proponents of a CFIUS-affected deal won a partial victory based on due process grounds, there may be countervailing willingness of foreign buyers to take risks if the review process is more transparent and transacting

Transactions to Face Increased Scrutiny, N.Y.L.J. (Nov. 19, 2020), achieved at <https://perma.cc/QH5T-WD95>.

¹⁰⁵ Anna Zhang, *China Outbound Investment Decline Continues, Inbound Rises amid COVID and Regulatory Challenges*, LEGAL WEEK (June 22, 2020), <https://perma.cc/M2QX-QGLR>.

¹⁰⁶ As one observer recently wrote:

There is more monitoring of the investment universe than ever, so a decision not to file is a riskier decision than it used to be. . . . [These days] it’s certainly wiser to seek [CFIUS] clearance on a preclose basis than to close and then hide and hope that the government won’t come looking for you later.

Vincent Chow, *Chinese Investment in US Plummets Under Increased Scrutiny*, LEGAL WEEK (Aug. 20, 2020), <https://perma.cc/BY7W-JLB7> (quoting Jeremy Zucker, cochair of the International Trade and Government Regulation Practice at Dechert, LLP, in Washington, D.C.). It is worth noting, though, that the recent change in presidential administration may signal a slight relinquishing of CFIUS power—yet another future uncertainty that may require explicit contractual allocation.

¹⁰⁷ Xue et al., *supra* note 97, at 1.

¹⁰⁸ Given how little control either party has and, thus, the near nonexistence of leverage in terms of responsibility for regulatory approval, Chinese buyers rarely use reverse termination fees to alleviate CFIUS-risk concerns. Rather, they’re most often used “in a competitive auction setting or in connection with submitting a topping bid.” *Id.* at 10.

¹⁰⁹ *See id.*

¹¹⁰ 758 F.3d 296 (D.C. Cir. 2014).

parties are able to more accurately assess the risk of regulatory prohibitions.¹¹¹

FIGURE 8: CFIUS PROVISIONS OVER TIME

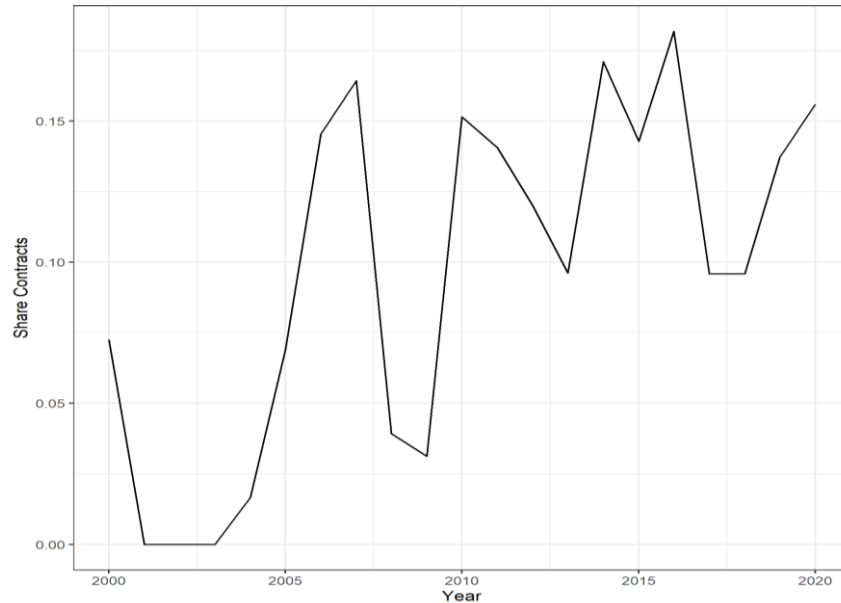


Figure 8 charts the empirical frequency of CFIUS-related provisions in the deals that we track. Although Figure 8 displays a very modest upward trajectory, it does not appear to manifest the strong and nearly monotonic pattern of the pandemic carve-outs above. Here, there appears to be significant annual variation, with relatively modest serial correlation over time. This pattern diverges from our benchmark case and, instead, has more of the markings of a setting where the deal-specific signal is relatively precise and informative relative to population-wide averages. Recall that under such circumstances, lawyers do not have to rely on market trends or information from other deals to determine the efficiency gains from the inclusion. Instead, they can adopt the mutation depending on its predicted utility in the individual contract, leading to less discernable overall trends.

¹¹¹ See *id.* at 325 (holding that the current CFIUS-review process, which does not require CFIUS or the president to disclose the information which forms the basis of an order, violated Ralls's due process rights, and requiring CFIUS and the president to disclose to Ralls all nonconfidential information used in making their recommendations and decisions during the review process).

In many ways, it makes sense for CFIUS provisions to exhibit such characteristics. The historical markers of CFIUS scrutiny—cross-border deals, critical infrastructure, and national-security-related industries—are relatively easy to anticipate from observed deal attributes (such as participant countries, implicated industries, and the nature of surviving ownership claims), allowing attorneys to customize their CFIUS-related provisions to each deal. Rather than overshooting or undershooting the efficient adoption rate, the inclusion of CFIUS provisions resembles a “just right” type of diffusion, in which the contract is well tailored to the situational environment.

C. Reverse Termination Fees

Reverse Termination Fees, or RTFs, (also known as “reverse breakup fees”) are fees that the buyer in a transaction may be obligated to pay if the deal fails to close. These provisions were first introduced in the 1980s but became more prevalent during the dot-com bubble, when private equity (PE) buyers began negotiating RTF provisions into deals to protect themselves in the event that they were unable to obtain adequate financing.¹¹² Sellers generally accepted RTFs for two reasons: First, during times of economic uncertainty, sellers felt that RTFs further incentivized buyers to obtain adequate financing while simultaneously offering sure compensation if a buyer failed. Second, RTFs provided extra security for sellers who felt that the threat to a purchasing company’s reputation in the event that they failed to obtain the necessary financing to close a transaction was simply insufficient collateral.¹¹³

The increased use of RTFs followed a spike in going-private transactions between 2005 and 2007, with language in strategic

¹¹² See Afra Afsharipour, *Transforming the Allocation of Deal Risk Through Reverse Termination Fees*, 63 VAND. L. REV. 1161, 1219–20 (2010).

¹¹³ Afra Afsharipour, *Paying to Break Up: The Metamorphosis of Reverse Termination Fees* 29–30 (U.C. Davis Legal Stud. Rsch. Paper No. 191, 2009), <https://perma.cc/F2SG-WP62>. Until around 2007, financial buyers often walked away from negotiations with a financing out, collateralized essentially by their reputation, while strategic buyers were much more likely to face litigation and ultimately damages liability. Vice Chancellor Strine noted that this was an “interesting asymmetry” and that “the factors driving it seem to include both economically rational ones and ones that are less rational.” *In re Topps Co. S’holder Litig.*, 926 A.2d 58, 72 n.11 (Del. Ch. 2007).

transactions mirroring that of PE deals.¹¹⁴ By 2006, 25%¹¹⁵ of all transactions—both strategic and financial¹¹⁶—included RTFs; in 2007, that number had risen to nearly 35%.¹¹⁷ When the financial crisis hit in 2008, strategic buyers began to face more stringent lending and credit standards and were treated more like financial buyers by banks and lenders,¹¹⁸ which encouraged strategic buyers to begin negotiating RTFs into their deals as well. By the 2008–mid-2009 period, 26.1% of strategic transactions included RTFs, up from 16.9% in the 2003–04 period.¹¹⁹

The RTF structure transformed as the provisions became more commonplace. Originally, RTFs were essentially just the flip side of the traditional seller-termination-fee coin, but, by 2008, three distinct styles of RTFs had emerged. First, the two-tier approach provided for the payment of two RTFs conditioned on different sets of triggers and occasionally permitted the seller to seek specific performance.¹²⁰ Second, the hybrid approach limited a buyer's liability for payment of the RTF in the event that circumstances beyond their control ultimately resulted in the termination of a deal but allowed a seller to seek specific perfor-

¹¹⁴ Afsharipour, *supra* note 113, at 49. *See generally* Dhruv Chand Aggarwal, The Agency Costs of Sellside Deal Protection: An Empirical Analysis of Reverse Termination Fees (March 25, 2020) (working paper), <https://perma.cc/U4HU-FEB3>; John C. Coates, Darius Palia & Ge Wu, Reverse Termination Fees in M&A (Jan. 26, 2018) (working paper), <https://perma.cc/8QXA-XH57>; Brian J.M. Quinn, *Optionality in Merger Agreements*, 35 DEL. J. CORP. L. 789 (2010).

¹¹⁵ 2007 TRANSACTION TERMINATION FEE STUDY 18, HOULIHAN LOKEY (2008), <https://perma.cc/9BC5-NETQ>.

¹¹⁶ Afsharipour, *supra* note 112, at 1169–70 (alteration in original) (quoting THERESE H. MAYNARD, *MERGERS AND ACQUISITIONS* 63 (2d ed. 2009)):

Strategic transactions generally involve operating synergies between the businesses of the buyer and the seller, or the aggregation of greater market power in a particular product line, for example the combination of two pharmaceutical companies. . . . Private equity buyers seek to acquire companies that they can grow and/or improve with the ultimate goal of “selling the cleaned up company to another buyer within a few years for a substantial gain, or alternatively, [taking] the company public.”

¹¹⁷ 2007 *Transaction Termination Fee Study*, *supra* note 115, at 18.

¹¹⁸ Afsharipour, *supra* note 113, at 55–56.

¹¹⁹ *Id.* at 73.

¹²⁰ The Merck-Schering transaction mandated an RTF of \$2.5 billion if the transaction failed to close due to a financing failure. If the transaction failed to close due to a lack of shareholders' approval or Merck engaged in a competing third-party transaction, Merck owed only a \$1.25 billion RTF. *Id.* at 52–53.

mance in the event that the buyer was responsible for circumstances leading to a transaction's termination.¹²¹ Third, the option-style approach essentially provided a worst-case scenario for buyers, giving them "broad walk-away rights with their exposure to damages limited to the RTF."¹²²

Between the 2003–04 period and the 2008–mid-2009 period, the percentage of strategic deals which included RTFs utilizing the option-style structure rose from 8.8% to 26.3%.¹²³ During the 2008 financial crisis, a record number of buyers walked away from deals, many taking advantage of the option-style RTFs, "which either permitted the buyer to walk [away] for any reason or gave the buyer broad latitude to arrange triggering of the payment of [a] fee"¹²⁴—often representing less than 10% of a deal's transaction value.¹²⁵

Many scholars believed that the record breakdown of deals represented the end of the RTF, but, by the 2015–17 period, 86% of large-market transactions and 50% of middle-market transactions were still memorialized by agreements containing RTFs.¹²⁶ However, the content of recent RTFs appears to differ from that of their predecessors. More RTFs now provide for limited specific-performance rights, employing a two-tier or hybrid structure,¹²⁷

¹²¹ In Pfizer's \$68 billion purchase of Wyeth, the \$4.5 billion RTF would be triggered only in the event that Pfizer could not obtain financing for reasons specified in the merger agreement; if Pfizer experienced a financing failure for any other reason, Wyeth could either seek specific performance or terminate the deal and collect the RTF from Pfizer. At the termination date, Pfizer would then have the option to close the deal with alternate financing or terminate the deal and pay Wyeth the RTF. *Id.* at 49–51.

¹²² *Id.* at 53. Additionally, in *United Rentals v. Ram Holdings, Inc.*, 937 A.2d 810 (Del. Ch. 2007), the court ultimately found that the buyer's perception of the RTF as essentially an option, or walk-away right, was reasonable. Thus, if the buyer walked away, the seller's recourse was limited to the RTF, even if the termination was created by the buyer's own breach. *Id.* at 832–33.

¹²³ Of the 26.1% of deals that included an RTF, 33.8% had RTFs coupled with provisions making the RTF the sole and exclusive remedy, precluding the seller from seeking specific performance. Afsharipour, *supra* note 113, at 44, 47–48.

¹²⁴ *Id.* at 48.

¹²⁵ *Id.* at 22; see also RICHARD A. PRESUTTI, MATTHEW J. GRUENBERG, ANDREW J. FADALE, STAVAN S. DESAI, WILLIAM J. MORICI & DAVID M. ROTHENBERG, SCHULTE ROTH & ZABEL, PRIVATE EQUITY BUYER/PUBLIC TARGET M&A DEAL STUDY: 2015-17 REVIEW AND COMPARATIVE ANALYSIS 4 (2018).

¹²⁶ These figures were down from 92% and 83%, respectively, in 2013–14. *Id.* at 15.

¹²⁷ In 2015–17, 81% of large-market transactions and 45% of middle-market transactions offered the seller limited specific-performance rights. Further, 83% of middle-market deals had provided limited specific-performance rights for the seller in the 2013–14 period. Put another way, 17% of large-market transactions offered the seller limited specific-

or are limited to instances where the buyer is unable to obtain adequate financing or regulatory (specifically antitrust) approval.¹²⁸ Additionally, RTFs—especially those limited to financial or regulatory failures—are often coupled with a reasonable best efforts standard, which has been key in protecting sellers in litigation following the breakdown of a deal.¹²⁹

performance rights, increasing to 19% in the 2015–17 period. In contrast, 55% of transactions in the 2015–17 period offered the seller full specific-performance rights, up from only 17% in 2013–14. *Id.* at 13.

¹²⁸ In 2005–19, 12.1% of deals had RTFs with antitrust-specific triggers. Dale Collins, *Antitrust Reverse Termination Fees--2019 Q3 Update*, SHEARMAN & STERLING: ANTITRUST UNPACKED (Dec. 10, 2019), <https://perma.cc/NW5A-SJZB>.

¹²⁹ In *Hexion Chemicals, Inc. v. Huntsman Corp.*, 965 A.2d 715, the Delaware Chancery Court evaluated whether the buyer had materially breached its representations, warranties, or covenants by trying to use the RTF as an option without first seeking alternate financing. Vice Chancellor Stephen Lamb held that

to the extent that an act was both commercially reasonable and advisable to enhance the likelihood of consummation of the financing, the onus was on [the buyer] to take that act. To the extent that [the buyer] deliberately chose not to act, but instead pursued another path designed to *avoid* consummation of the financing, [the buyer] knowingly and intentionally breached this covenant.

Id. at 749 (emphasis in original).

FIGURE 9: REVERSE TERMINATION FEES OVER TIME

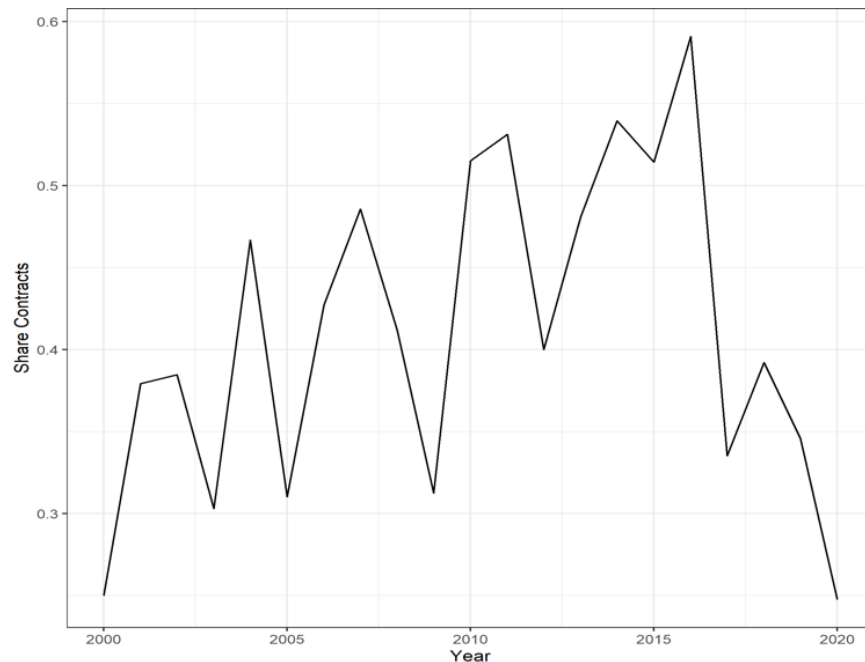


Figure 9 illustrates the frequency of RTFs over time. Much like CFIUS provisions, RTFs appear to have very weak discernible patterns. One interpretation is that, like with CFIUS provisions, these terms are generally more likely to “get it right” from deal to deal, depending on structure. For example, financing costs remained at historic lows coming out of the 2008 financial crisis, and cash buyers were unlikely to categorically find value in preserving an escape hatch in their deal through an RTF. In addition, as markets stabilized, many industry sectors hosting stock-based transactions were subject to less external volatility (once again reducing the attractiveness of an RTF).

Perhaps because of some of these general reasons, since around 2016, RTFs have become mildly less popular in the deals that we have tracked. The reduction in take-up, however, does not appear as precipitous as in other settings, and thus, even if there were a general trend away from RTFs since 2016, it has manifested with an uneven pattern that suggests that deal-to-deal heterogeneity is responsible for most of the fluctuation. Indeed, such idiosyncratic heterogeneity is perhaps the most plausible candidate that can be identified with our canonical patterns simulated above.

D. #MeToo Representations

Around the beginning of 2018, as the #MeToo movement became a household conversation topic, it became clear that the risks associated with sexual harassment allegations against a company's executives were not just reputational but also economic, as companies began to realize that "sexual harassment allegations and lawsuits . . . could actually sink a deal and have significant ramifications."¹³⁰ In response to the "major financial risk"¹³¹ of undisclosed or post-closing sexual harassment scandals, lawyers began adding #MeToo provisions to transaction agreements, disclaiming a party's knowledge of allegations of sexual harassment within or against employees of the company within a specified timeframe. The first of these clauses appeared in a March 2018 deal between SJW Group and Connecticut Water Services.¹³² Within a year, thirty-nine publicly disclosed deals contained these so-called Weinstein clauses.¹³³ The clause can appear in a variety of incarnations—including a representation, an MAE provision, or even a closing condition—but the most common (and effective) form is "a representation and warranty by the target . . . that since a specific date no allegations of sexual harassment or misconduct have been made against the company's officers or executives."¹³⁴ Breaches of this representation offer the buyer recourse, though the extent of the remedy varies depending on whether the deal is private or public.¹³⁵

Most #MeToo representations follow a now familiar protocol pattern:¹³⁶ a specified look-back period, limitations regarding relevant employees, related disclosure schedules, and a knowledge standard.¹³⁷ Each of these steps can limit or expand the scope of

¹³⁰ Chelsea Naso, *#MeToo Movement Molds New Protections in Mergers*, LAW360 (Jan. 18, 2019), <https://perma.cc/8MNV-F568>.

¹³¹ *Id.*

¹³² Jaclyn Jaeger, *The 'Weinstein Clause': M&A Deals in the #MeToo Era*, COMPLIANCE WK. (Oct. 12, 2018), <https://perma.cc/7XSB-HN2P>.

¹³³ Anna Windemuth, *The #MeToo Movement Migrates to M&A Boilerplate*, 129 YALE L.J. 488, 503 (2019).

¹³⁴ Burnett, *supra* note 69.

¹³⁵ Clawbacks—allowing the buyer to recoup some of its investment or purchase price—appear more often in private-company acquisitions, though the clauses have "more discursive potential in the public-deal context," given the reputational impact that including or excluding such a provision might have on a company's reputation regardless of the underlying allegations. Windemuth, *supra* note 133, at 498.

¹³⁶ See *id.* at 503 (surveying nine specific features common to Weinstein clauses).

¹³⁷ These standards tend to vary in accordance with typical negotiation-related factors like the leverage of the respective companies, but it is worth noting that in the context

the following general idea: “Since x date there have been no sexual harassment allegations against the company’s executives.”¹³⁸ The look-back period is most commonly three to five years.¹³⁹ The representations generally cover allegations against only high-level employees and are often limited in application to allegations against anyone at the rank of senior vice president or above.¹⁴⁰ Disclosure schedules are used less frequently but can be a useful qualification tool, as they remain confidential. However, some practitioners note that a “prefatory reference to a disclosure schedule might . . . suggest[] that [a company] has significant sexual-harassment liabilities,”¹⁴¹ so target companies are wary of such a method of incorporating allegations.¹⁴² The knowledge standard is perhaps the most variable term: target companies seek to limit their liability by requiring actual knowledge or limiting the knowledge requirement to “personnel who would ‘reasonably be expected to have actual knowledge’ of [such] matter[s],”¹⁴³ while buyers often prefer a constructive knowledge requirement.¹⁴⁴ Essentially, the Weinstein clause ends up operating as a guideline with respect to the level of due diligence that an acquirer must conduct to accurately assess the risk affiliated with a target company.

There are two general points worth noting about the underlying idea behind #MeToo representations and their variations:

of Weinstein representations, there is more pressure in certain industries, with “[t]he provision[s] disproportionately appear[ing] in deals involving ‘strong, founder-led businesses,’ such as ‘technology and media and entertainment companies.’” *Id.* at 516 (quoting a telephone interview with a subject).

¹³⁸ Burnett, *supra* note 69.

¹³⁹ Additionally, some representations include two time periods: one (usually shorter) regarding allegations required to be reported and one (usually longer) for complaints. See *Market Trends 2019: #MeToo Representations*, LEXIS PRACTICAL GUIDANCE.

¹⁴⁰ See *id.*

¹⁴¹ Windemuth, *supra* note 133, at 508.

¹⁴² *Id.* at 508–09.

¹⁴³ *Id.* at 507 (citing Pac. Biosciences of Cal., Inc., Agreement and Plan of Merger 7 (Form 8-K, Exhibit 2.1) (Nov. 5, 2018)).

¹⁴⁴ Constructive knowledge widens the scope by including in the representations allegations that the target company might have uncovered with reasonable investigation. A buyer’s preference would obviously be to have no knowledge requirement—and therefore unlimited liability on the seller’s behalf—but of all publicly filed M&A contracts (as of June 17, 2019), only seven deals (or 16%) did not include a knowledge qualifier, implying “it would take a strong buyer to keep it out.” Burnett, *supra* note 69. For a discussion of actual versus constructive knowledge requirements in the context of Weinstein representations, see Javon Johnson, Comment, *An Epidemic of Workplace Sexual Misconduct: The Birth of the Weinstein Clause in Merger and Acquisition Agreements*, 52 TEX. TECH. L. REV. 377, 401 (2020).

First, the inclusion of these representations highlight the level of risk associated with sexual harassment as opposed to other types of litigation that a company may face. Second, the representations require a target to affirm its knowledge of *allegations* of sexual harassment or misconduct, lowering the threshold for disclosure below any legally anointed claim.¹⁴⁵ These two unique aspects of #MeToo representations emphasize (1) how hyperaware buyers currently are of the “potentially devastating financial and social consequences of [] sexual misconduct”¹⁴⁶ and (2) the “relationship between corporate dealings and social norms.”¹⁴⁷ Some have expressed concerns related to due process issues stemming from disclosure of unproven allegations or the possibility that #MeToo representations encourage a target company to discourage reporting to increase the likelihood of an acquisition. However, given the depth of due diligence that companies conduct when looking into a potential target, it is equally likely that companies, especially startups, might actually reevaluate the mechanisms by which they handle such misconduct.¹⁴⁸ It remains to be seen whether the Weinstein clauses have taken their final form, but the legal world has generally accepted that the provisions are here to stay.

Figure 10 illustrates the adoption of #MeToo representations over time. Note the facial similarity to pandemic carveouts of the significant uptick in adoption, which is also consistent with our benchmark case. For Weinstein representations, however, the sudden increase is even more explosive, with a dramatic spike in 2018 alone. Such seemingly discontinuous shifts, then, also seem consistent with our regime-shift simulations,¹⁴⁹ in which the underlying economics of the inclusion of the provision suddenly shift. This seems consistent with the arrival of the #MeToo movement at around the same time, with an increased call for companies to renew their vigilance (or embrace it for the first time) in redressing long-standing allegations of sexual harassment and abuse among their most senior executives.

¹⁴⁵ See Burnett, *supra* note 69. Additionally of note is the fact that all thirty-nine deals published within the first year of the Weinstein clause’s introduction left the word “allegation” undefined. Windemuth, *supra* note 133, at 512.

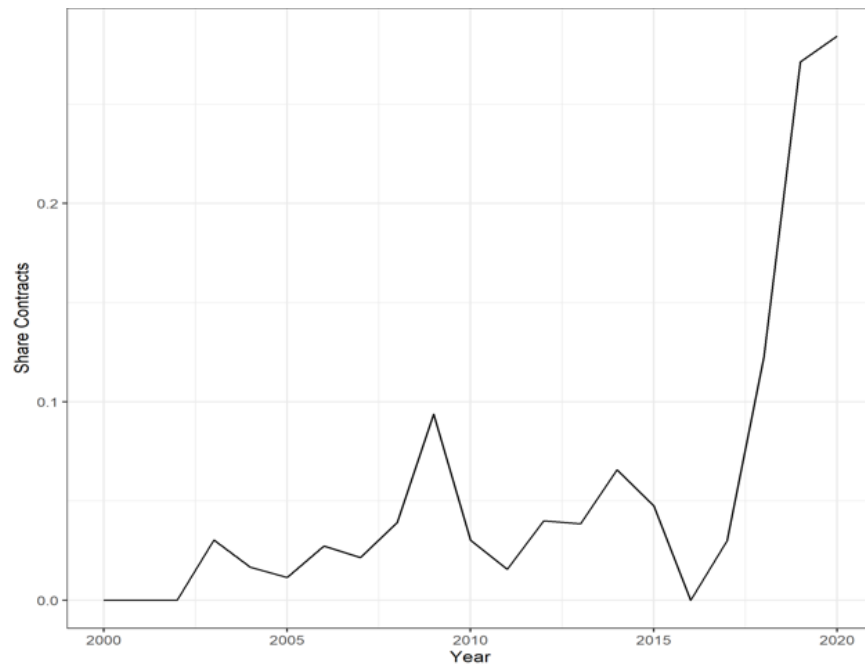
¹⁴⁶ *Mergers & Acquisitions Alert: #MeToo Movement Gives Rise to Use of “Weinstein Clause” in M&A Transactions*, ARCHER (Aug. 2018), <https://perma.cc/U8NT-YJ9F>.

¹⁴⁷ Johnson, *supra* note 144, at 407.

¹⁴⁸ Windemuth, *supra* note 133, at 525 & n.181.

¹⁴⁹ See *supra* Figure 5.

FIGURE 10: #MeToo REPRESENTATIONS OVER TIME



As with pandemic carveouts, it is difficult to know whether the diffusion pattern of #MeToo provisions will continue to rocket upward or will equilibrate to a “new normal.” Alternatively, for example, the dramatic shift in awareness of sexual-harassment issues could cause firms to become far more perceptive in diagnosing where and when such problems exist, and the new normal in this case might well converge only to a subset of companies where the signals look particularly worrisome.

E. Top-Up Options

Top-up options refer to special stock options that can be granted by the board of a target company to a bidder who has launched a tender offer for the target.¹⁵⁰ Exercising the options allows the bidder to purchase newly issued shares in order to

¹⁵⁰ See Steven M. Davidoff, *The Return of the Tender Offer*, M&A LAW PROF BLOG (July 10, 2007), <https://perma.cc/3P6C-DT9U>. See generally MARK A. MORTON & JOHN F. GROSSBAUER, POTTER ANDERSON & COROON, TOP-UP OPTIONS AND SHORT FORM MERGERS (2002), <https://perma.cc/X8L6-U7M5>; Erik Devos, William B. Elliot & Hilmi Songur, Top-Up Options and Tender Offers (May 7, 2014) (working paper), <https://perma.cc/2KWF-9N6R>; Coates, *supra* note 54.

reach the 90% ownership threshold necessary to effectuate a short-form merger. Historically, this threshold was critical for many bidders, because, once they crossed it, they could make use of a special Delaware statute (Delaware General Corporate Law (DGCL) § 253) to execute a short-form, back-end merger, forcing all remaining holdout shareholders to relinquish their shares.¹⁵¹ Typically, in order to exercise the options, the bidder must have been sufficiently successful in their tender offer to get within “spitting distance” of 90%, usually measured as above some specified point in the 75–85% ownership range of the target. For several years, top-up options were an effective way for bidders unable to reach the 90% threshold with their initial tender offer to avoid the potentially lengthy process of a long-form merger where the target corporation was required to hold a stockholder meeting to approve the deal.¹⁵²

Top-up options first began to appear in 1999 and started to gain particular traction after 2006, when a new rule enacted by the SEC reduced some of the litigation risk associated with their use. By 2008, the inclusion of top-up options had become standard—100% of negotiated tender offers from that year included one.

In recent years, however, top-up options have lost some of their luster due to a statutory reform that made them less necessary. In 2013, the Delaware legislature amended DGCL § 251 by introducing § 251(h).¹⁵³ Section 251(h) introduced a somewhat more forgiving approach for two-step mergers that would allow an acquirer to freeze out the holdout shareholders even when they comprised up to 49.9% of the shareholder base. Because of this relaxed threshold, the need for top-ups to get to 90% ownership was substantially mooted.

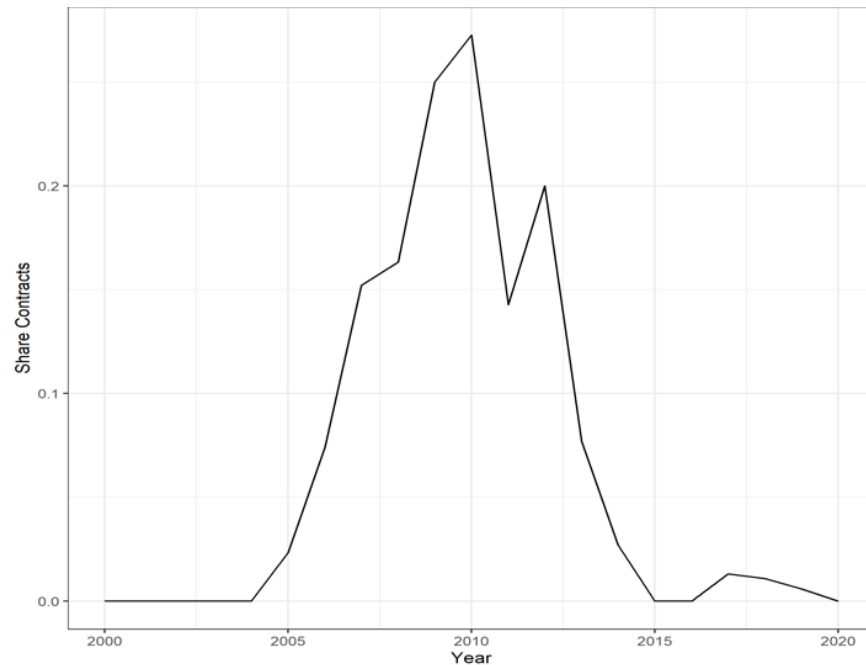
Figure 11 illustrates the empirical frequency of top-up options over the span of our data. The pattern here is striking: although top-ups were on a precipitous rise starting around 2005, they collapsed after 2013, and now top-ups barely register a pulse in annual frequencies. The up-and-down pattern of this chart looks most like the regime-shock simulations in Figure 5 above.

¹⁵¹ DEL. CODE ANN. tit. 8, § 253 (2021).

¹⁵² MORTON & GROSSBAUER, *supra* note 150, at 2 n.11.

¹⁵³ Daniel I. Fisher, *DCGL Section 251(h): Top-Up Option No Longer Needed*, AG DEAL DIARY (Sept. 3, 2013), <https://perma.cc/V72Z-ZZPZ>; James Matarese & Danielle Lauzon, *Death of the Top-Up Option in Two-Step Transactions*, CLS BLUE SKY BLOG (Oct. 17, 2013), <https://perma.cc/GH5S-HRGJ>.

FIGURE 11: TOP-UP OPTIONS OVER TIME



Viewed against the statutory context described above, the regime-shock label is an apt one. The promulgation of DGCL § 251(h) in 2013 substantially sucked the wind from the sails of top-up options because it dramatically lowered the threshold necessary to pull off a two-step merger. Moreover, with a lower threshold (usually 50%) in such deals, the continued use of a top-up to make it over the finish line would be particularly perilous, since many such transactions would likely invoke heightened fiduciary duties under the doctrine of *Revlon, Inc. v. MacAndrews & Forbes Holdings, Inc.*,¹⁵⁴ and a top-up would seem especially suspect.

F. Choice-of-Law and -Forum Provisions

The final provision that we study is the inclusion of a term selecting the forum that will govern any disputes arising from the contract, typically referred to as a choice-of-forum provision. A choice-of-forum provision establishes personal jurisdiction of a court in case a dispute arises between the parties. In effect, it is

¹⁵⁴ 506 A.2d 173 (Del. 1986); see also Morton & Grossbauer, *supra* note 150, at 6, 9 n.12.

a contractual device to reduce uncertainty in contractual relationships with parties that have connections to several jurisdictions.¹⁵⁵ Many modern commercial transactions fall into this category because factors like the state of incorporation, the place in which contract negotiations occur, and the location of performance can occur in different locations, and each can establish personal jurisdiction. In the context of M&A, choice-of-forum provisions are of particular interest because they can reflect two competing interests of the parties. On the one hand, most corporations are incorporated in Delaware, and its courts have garnered significant expertise in presiding over corporate law disputes.¹⁵⁶ At the same time, New York has long been the favored jurisdiction for business law disputes, including most commercial contract disputes.¹⁵⁷ The preference is at least partially the result of a concentrated effort by New York courts to adhere to a strict, textualist interpretation of contractual language. Indeed, New York is famous for sticking to the “four corners” of the writings as it interprets the contract, thus providing the certainty and predictability often sought by commercial parties.¹⁵⁸

Traditionally, it has been relatively easy for parties to access courts in New York. In assessing personal jurisdiction, courts

¹⁵⁵ For a detailed account of the choices that parties have to address the uncertainty, see David A. Hoffman, *Whither Bespoke Procedure?*, 2014 U. ILL. L. REV. 389, 425–29 (analyzing the extent to which parties make use of their contractual liberty to customize the forum and procedure broadly). For a discussion of choice-of-forum provisions and how they are interpreted in practice, see John F. Coyle, *Interpreting Forum Selection Clauses*, 104 IOWA L. REV. 1791, 1803–19 (2019) (discussing the scope of interpretation for forum-selection clauses).

¹⁵⁶ Matthew D. Cain & Steven M. Davidoff, *Delaware’s Competitive Reach*, 9 J. EMPIRICAL LEGAL STUD. 92, 98 (2012) (studying the attraction of Delaware for corporate litigation and finding that it is highly valued by attorneys in this particular context).

¹⁵⁷ See Theodore Eisenberg & Geoffrey P. Miller, *The Flight to New York: An Empirical Study of Choice of Law and Choice of Forum Clauses in Publicly-Held Companies’ Contracts*, 30 CARDOZO L. REV. 1475, 1504 (2009) (finding that New York is the most prominent forum for commercial disputes); see also Nyarko, *supra* note 24, at 39 (confirming these findings using a larger sample of commercial agreements).

¹⁵⁸ The four-corners rule

imparts “stability to commercial transactions by safeguarding against fraudulent claims, perjury, death of witnesses . . . infirmity of memory . . . [and] the fear that the jury will improperly evaluate the extrinsic evidence.” Such considerations are all the more compelling in the context of real property transactions, where commercial certainty is a paramount concern.

W.W.W. Assocs., Inc. v. Giancontieri, 566 N.E.2d 639, 642 (N.Y. 1990) (alterations in original) (citation omitted) (citing EDITH L. FISCH, FISCH ON NEW YORK EVIDENCE § 42 (2d ed. 1977)).

used to apply the “doing business” test, under which it was sufficient that a company does business “with a fair measure of permanence and continuity” in New York to establish jurisdiction.¹⁵⁹ Since most companies trying to access New York courts did some amount of business there, a choice-of-forum provision may have been obsolete. However, in 2011, the U.S. Supreme Court started narrowing the test to the “essentially at home” test, which limits general jurisdiction over a company to its place of incorporation and its principal place of business.¹⁶⁰ And although these disputes were not contract disputes, courts in New York quickly embraced the narrower test to reject jurisdiction in contracts cases.¹⁶¹ Most importantly for our purposes, since it has become more difficult to access New York courts without a choice-of-forum provision, the change in precedent can be understood as a regime shock of the type we discussed above.

Figure 12 depicts the incidence of choice-of-forum provisions that establish the jurisdiction of New York courts. Relatively few contracts started out including a choice-of-forum provision. However, in 2010, at the advent of the change in precedent, the inclusion rate suddenly and dramatically increased, from about 13% to over 50% in subsequent years. Such a dramatic increase is consistent with our regime-shock example, providing preliminary evidence that drafters in the M&A context observed and quickly adjusted to their changed environment.¹⁶²

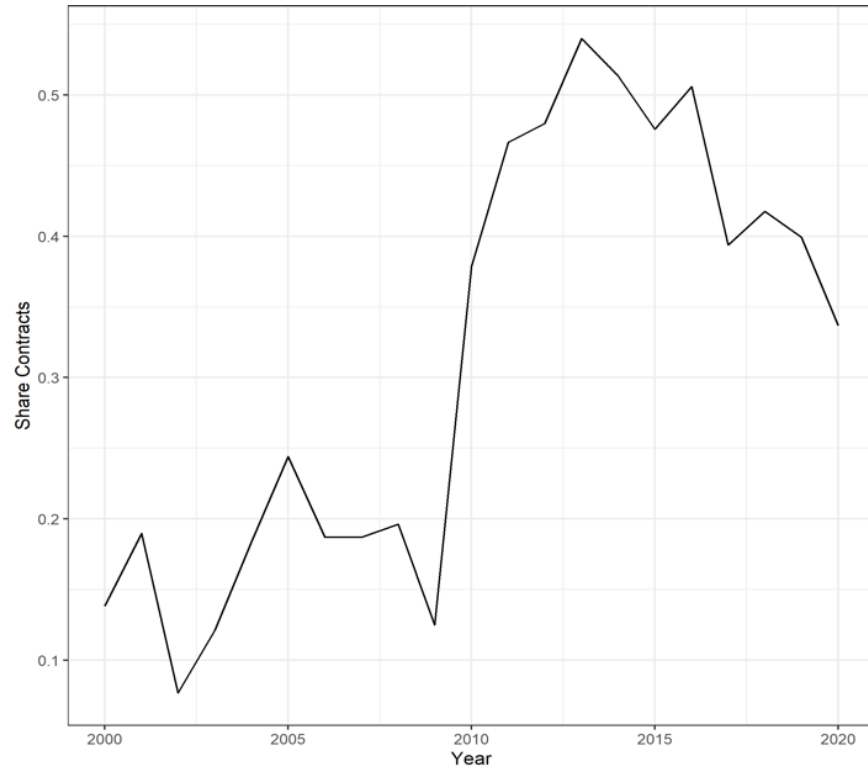
¹⁵⁹ See, e.g., *Tauza v. Susquehanna Coal Co.*, 115 N.E. 915, 917 (N.Y. 1917).

¹⁶⁰ *Goodyear Dunlop Tires Operations, S.A. v. Brown*, 564 U.S. 915, 919 (2011); see also *Daimler AG v. Bauman*, 571 U.S. 117, 139 (2014).

¹⁶¹ See, e.g., *Blustein v. Akam*, No. 7855/2016, 2017 WL 2529647, at *1 (N.Y. Sup. Ct. May 2, 2017) (denying jurisdiction in a breach of contract case with references to *Daimler* and *Goodyear*); *Trodale Holdings, LLC v. Bristol Healthcare Invs., LP*, No. 16 Civ. 4254, 2017 WL 5905574, at *9–10 (S.D.N.Y. Nov. 29, 2017) (applying the “essentially at home” test to deny jurisdiction over companies incorporated in Georgia and Tennessee); *Letom Mgmt. Inc. v. Centaur Gaming, LLC*, No. 17 Civ. 3793, 2017 WL 4877426, at *4 (S.D.N.Y. Oct. 27, 2017) (denying general jurisdiction over a defendant incorporated in Indiana under the “essentially at home” test).

¹⁶² We note that one of us has previously conducted a study of commercial contracts more generally to assess whether there was a change in the proclivity to include choice-of-forum provisions for any jurisdiction following a change in Supreme Court jurisprudence. Such an effect was not observable in this broader context. See Nyarko, *supra* note 24, at 59–64.

FIGURE 12: CHOICE OF FORUM OVER TIME



G. Formal Calibration and Testing

As noted at the outset of this Part, our efforts to track an assortment of adoption trajectories serve principally as a way to illustrate the plausibility of the various paths that our theoretical framework is capable of generating. While a helpful (and, in many respects, necessary) way to apply any model to real-world data, our treatment has been deliberately informal and heuristic. We acknowledge, however, that some readers may want more technical treatment of how one could use empirical methods to calibrate the deep parameters of our model (such as Z , r_0 , and γ) and test the parameters against a variety of hypotheses. Although developing such an approach is beyond the scope of this Article, we briefly pause here to offer an overview of a promising approach that we plan to pursue in future work.

Calibrating our model using real-world data would require developing a statistical methodology by which to “fit” an observed diffusion path against our underlying theoretical framework. The

simplicity of doing so, however, can vary from context to context. Certain theoretical models, for example, generally lend themselves to this enterprise, since they yield solutions that are linear in the relevant parameters and, thus, can be estimated confidently with linear-regression techniques.¹⁶³ In other settings, the relationships generated are not linear but still tractably nonlinear, enabling modest modifications of linear regression.¹⁶⁴

Our model corresponds to neither approach, since it does not generate closed-form solutions (be they linear or nonlinear), and thus it can only be solved numerically, through simulation. That said, it is still possible to calibrate our framework by embedding our simulations themselves into an iterative model that estimates deep parameters to maximize the likelihood of observing our patterns. Such “simulated maximum likelihood” approaches are increasingly common in empirical finance¹⁶⁵ and lend themselves well to this environment. Our tentative efforts to utilize this approach—while still too preliminary to report here—appear promising.

IV. IMPLICATIONS

In the foregoing Parts, we have developed, analyzed, and applied to real-world data a holistic framework for contract-term evolution. We have shown that patterns of diffusion not only can manifest in several distinct ways but that they appear to do so with some regularity in practice. While certain diffusion patterns appear to bear the markers of cascading sorts of behavior (diffusing quickly and categorically), others suggest a more bespoke tailoring of terms to fit the context. This Part considers the broader implications of our analysis. We highlight three such implications here: (1) adjudicating between the competing accounts of contractual evolution outlined in Part I, (2) developing a theory of bargaining in transactions where prices are fixed early on and

¹⁶³ See generally, e.g., Michel Terraza & Roman Mestre, *Adjusted Beta Based on an Empirical Comparison of OLS -CAPM and the CAPM with EGARCH Errors*, 26 INT'L. J. FIN. & ECON. 3588 (2020) (comparing a variety of linear regression models to estimate the Capital Asset Pricing Model in finance).

¹⁶⁴ See generally Matthew Spitzer & Eric Talley, *Left, Right, and Center: Strategic Information Acquisition and Diversity in Judicial Panels*, 29 J.L., ECON. & ORG. 638 (2013) (calibrating a nonlinear model of judicial deliberation).

¹⁶⁵ See generally, e.g., Jon Danielsson, *Stochastic Volatility in Asset Prices: Estimation with Simulated Maximum Likelihood*, 64 J. ECONOMETRICS 375 (1994) (using similar methods to analyze a variety of financial dynamic asset pricing models).

nonprice terms follow, and (3) extending our framework to take on nonrational-actor decision-making.

The first, and perhaps the most important, implication of our analysis concerns what it reveals about the stylized accounts of contract evolution discussed in Part I. While each of the Goldilocks accounts highlighted has some intuitive appeal, they are difficult to reconcile into a complete, parsimonious, and general picture of term evolution. And our analysis above exposes several of these limitations. For example, the just-right account makes a strong prediction that terms should hew closely to economic-efficiency considerations underlying a deal. All else constant, a novel term should be adopted if and only if it creates value for the parties who adopt it. A direct corollary to this point is that when the economics of different transactions are highly heterogeneous (a reasonable assumption in most cases), efficient terms should echo that heterogeneity as negotiators fashion bespoke terms. Our analysis, however, demonstrates that such heterogeneity is far from inevitable, even for the most motivated and rational negotiators. Particularly in settings where attorneys have limited information or expertise, they will not be able to identify with certainty the most efficient term on a deal-by-deal basis. Moreover, as our benchmark simulations show, attorneys may even begin rationally to ignore deal-specific information that they are able to ascertain, particularly if they come to believe that population characteristics heavily favor one type of term over another. In such settings, drafting practices can start to resemble a “contractual cascade,” with attorneys gravitating toward a monolithic term. This untailored term might yield beneficial results on average, but it remains a blunt instrument of contractual design.

At the same time, neither the too-cold nor the too-hot accounts of contract evolution provides a complete picture. Consider the former, which posits that terms will stubbornly (and inefficiently) resist change. Such outcomes could also occur within our framework, which does not assume any special form of risk aversion or profound lack of sophistication. Yet within our framework, the rise of an inefficient “black hole” would generally require several special preconditions. Most immediately, it would require that attorneys begin with an incorrect prior belief that the conventional term is optimal overall. Second, the negotiators would need to have limited information and expertise so that their (incorrect) beliefs about the overall population prove difficult to overcome. And finally, other limitations would have to be so severe as

to prevent transacting attorneys from effectively learning over a reasonable period of time—either because they lack an understanding of their transaction or because the number of firms is so large that repeat play and concomitant learning by doing is not possible. When learning is possible over time, the system might still gravitate to a single modal term, but that term will be resilient over time only if it gets it right most of the time. Black holes could certainly emerge in some special cases of our framework, but the predicate conditions seem hardly general.

A second implication of our analysis is that it may help us to investigate deeper quandaries about how complex transactions are negotiated by lawyers. As is well known, large corporate transactions and financings often follow a pattern that an economist would find odd (if not backwards): essential terms—and particularly the price—are usually set first, and only afterward are the remaining terms negotiated. This pattern is unusual in many ways, since the price is a key mechanism for distributing the gains provided by nonprice terms. If, for example, it is more efficient for a deal to have a pandemic carveout, its inclusion will likely impose greater risks and costs on the buyer, who is now constrained in her capacity to walk away from the deal. One way to convince the buyer to accept the efficient carveout is to give the buyer a downward price concession, allowing her to monetize some fraction of the gains created. When the price is fixed first, such fluid monetary “settling up” is no longer possible.

Our model for contract-term evolution may contain the seeds for resolving this paradox in that it reveals how and when a similar type of efficient settling up could still operate through informal bartering of nonprice terms. In other words, efficient bargaining when the price is already fixed can still occur so long as there exists a nonprice term that operates somewhat like a price. For example, suppose that deals increasingly came to warrant pandemic carveouts in force majeure provisions and that this trend was driven by considerations for value creation. By definition, the adoption of the carveout increases the joint surplus for the parties, but alone it could make the buyer worse off by imposing additional risk on them. A sophisticated buyer might still agree to this term if the seller is willing to adjust one of the more fluid, pricelike provisions of the deal, such as the size of the buyer’s RTF. Viewed in this context, then, we might find evidence of effi-

cient bargaining in nonprice terms if RTF triggers shrink (benefitting buyers) at the same time that pandemic exclusions proliferate (imposing costs on the buyer).¹⁶⁶

Finally, our framework represents a good starting point for developing deeper accounts of term evolution that combine learning dynamics with other “bounded rationality” theories of contracting. Behavioral economics and finance, for example, have generated scores of insights about how parties may behave in a way that diverges (at least in some degree) with rational-actor models. In our framework, it would be possible to introduce behavioral biases into the learning process in several ways. For instance, there is growing evidence that even sophisticated parties tend to deviate from strict Bayesian reasoning when assessing their environments, often placing too much weight on their own prior experiences, assuming them to be representative of the larger class.¹⁶⁷ Such non-Bayesian reasoning could well induce a type of local-lock-in effect in which certain firms tend to push a contract mutation while other clusters tend to hold fast to the traditional term. Inquiries such as these represent an interesting and potentially fertile area to generalize and deploy our framework. Although we leave them for future endeavors, we note that a precondition to even beginning to incorporate such biases is the existence of a holistic framework for thinking about how and when contract terms evolve—and this Article has provided such a framework.

CONCLUSION

When Tiffany and LVMH triumphantly announced their acquisition agreement in late 2019, they did so at a moment that we would soon come to identify as the temporal dividing line between the “before times” and our post-pandemic world. Although such watershed moments are (fortunately) infrequent, they also create

¹⁶⁶ We note that in related work, we were not able to find strong evidence of tradeoffs between RTFs and pandemic carveouts. See generally Matthew Jennejohn, Julian Nyarko & Eric Talley, *COVID-19 as a Force Majeure in Corporate Transactions* (Colum. L. & Econ. Working Paper No. 625, 2020), <https://perma.cc/66QL-UVX8>. In light of our framework, this observation casts doubt on the extent to which efficient nonprice horse trading occurs in this context (at least as related to RTFs).

¹⁶⁷ See generally, e.g., JONATHAN BARON, THINKING AND DECIDING (3d ed. 2000) (describing a variety of cognitive phenomena that limit human rationality); Daniel Kahneman & Amos Tversky, *Subjective Probability: A Judgment of Representativeness*, 3 COGNITIVE PSYCH. 430 (1972) (exploring how the “representativeness” cognitive heuristic results in predictable and systematic errors in evaluation of uncertain events).

an opportunity for scholars to consider whether and how commercial practices evolve as such events unfold and potentially change the rules of the game. In so doing, such practices can also change law.

In this Article, we have used our current watershed moment in history as an invitation to analyze more rigorously how contracting practices evolve over time in the context of a changing environment. We have developed and analyzed a holistic model of contract-term evolution that delivers insights about how economics, information, learning, and lawyering interact to shape contracting practices—and to change law in the process. These insights, moreover, can be directly compared to measurable empirical trends in contract practices, which we document using two decades' worth of M&A contract terms. This comparison suggests that term diffusion and evolution is not a monolithic phenomenon but instead unfolds differently according to context. While some trends bear the markers of efficient markets, others appear to manifest behavior more consistent with other patterns, such as cascades or black holes. And in turn, our analysis allows us to situate many of the stylized accounts of term evolution as special cases of our more general framework.

Although our study contributes to a more systematic accounting of the literature on contract-term evolution, it also can be easily extended to take on other phenomena not examined here. We have posited a few such applications, including using our framework to assess whether complex contract negotiation displays features of bartering, in which concessions on nonprice terms are traded off rather than accounted for in the price. Our analysis can also help open up a more general and testable theory of when and how behavioral biases affect contracting trends and whether countervailing forces are able to counteract them. Much of where these extensions ultimately lead is yet to be seen. But we conjecture that in many applications, it is likely that contracting—and not love—will prevail.

APPENDIX: FORMAL ANALYSIS OF MODEL

For more technically minded readers, this Appendix presents in a more formal fashion the model outlined informally in the main text. There are five key sets of assumptions that frame this inquiry. They are summarized as follows:

- (1) Nonprice terms constitute a central vehicle through which negotiating parties are able to make value in a contractual setting.
- (2) Most of the negotiation over, and search for, such nonprice terms is done by attorneys outside the firm who are specialists in negotiating deals on behalf of their clients but are not directly supervised by their clients.
- (3) In negotiating a nonprice term, counsel typically start with a default term and then consider whether an alteration to that the default term—a mutation—should replace it.
- (4) Counsel will adopt the mutation only if they consider it to be value enhancing to a sufficient degree.
- (5) Counsel bargain over whether to adopt the mutation using two sources of information:
 - First, they have some (imperfect) ability to discern whether the deal in front of them is a better fit with the status quo term or the mutation.
 - Second, counsel have experiences from prior deals that they have negotiated, which they can leverage to benchmark their inklings about the current deal. This includes the prior experience of counsel in adopting (or rejecting) the mutation.

Each of these assumptions is, we believe, defensible for reasons described in Part II. We formalize each of them below within an environment that we make as simple as possible while still capturing the steps articulated above. In walking through the analysis below, we frequently illustrate intermediate outcomes by imposing the numerical values from our benchmark simulations in Part II.C of the text (pictured in Figure 1).

A. Deal Sequence and Population of Firms

Our model unfolds dynamically over discrete time increments denoted by $t \in \{1, 2, 3 \dots\}$. In each period t , a potential acquisition deal emerges involving a buyer b who values the asset at $v_b > 0$ and a seller s who values it at $v_s > 0$ (where these values are benchmarked against a deal that is executed pursuant to a standard form contract). The realized values of v_b and v_s are drawn randomly from a distribution function $F(v_b, v_s)$. The buyer and

seller observe these values and pursue a transaction only if $v_b > v_s$; and thus, in the most general setting, there can be some periods in which there is a deal struck. For purposes of our benchmark analysis, however, we will assume that each potential transaction yields a deal with probability equal to one.

To execute a deal, the buyer and seller each must work with outside legal counsel. Their choices must be taken from a universe of N law firms, indexed by $i = 1, 2, \dots, N$. Each firm is associated with a (scalar) “reputational capital” value, which we denote by the indexed variable θ_i and which we normalize between 0 and 1. The N -dimensional vector of reputations is denoted $\Theta \equiv \{\theta_1, \theta_2, \dots, \theta_N\}$. For each period’s transaction (i.e., a consummating buyer-seller pair) the parties must select two different law firms to represent them from the population. We represent this pairing process to unfold according to a probabilistic selection matrix P pictured as follows:

MATRIX A1: MERGER REPRESENTATION

$$P = \begin{bmatrix} 0 & p_{1,2} & \cdot & \cdot & \cdot & p_{1,N} \\ p_{2,1} & 0 & \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & 0 & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & 0 & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot & 0 & p_{N-1,N} \\ p_{N,1} & p_{N,2} & \cdot & \cdot & p_{N,N-1} & 0 \end{bmatrix}$$

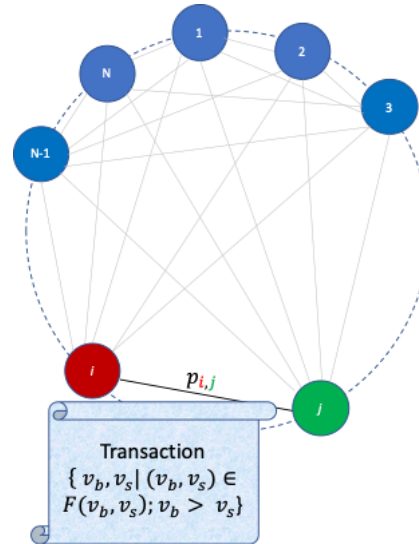
Each row of the matrix corresponds to the firm representing the buyer and each column corresponds to the firm representing the seller. We keep the structure of P deliberately general at this stage, other than to require that all entries along the diagonal must be zero (no law firm is allowed to represent both buyers and sellers simultaneously), and its remaining components must add up to one. Thus, for example, the component probabilities might be scaled to firm reputational capital.

In our benchmark analysis, we assume that there are ten firms, each of which has identical reputational capital of $\frac{1}{2}$. Consequently, the probabilistic-assignment matrix is effectively random among the firms, and thus each nondiagonal element represents one permutation of distinct assignment of the firms to the buyer and seller.

MATRIX A2: MERGER REPRESENTATION FOR TEN FIRMS

$$P = \begin{bmatrix} 0 & \frac{1}{90} & \cdot & \cdot & \cdot & \frac{1}{90} \\ \frac{1}{90} & 0 & \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & 0 & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & 0 & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot & 0 & \frac{1}{90} \\ \frac{1}{90} & \frac{1}{90} & \cdot & \cdot & \frac{1}{90} & 0 \end{bmatrix}$$

Figure A1 conceptually lays out a representative transaction occurring at period t that is assigned to two specific firms in the eligible population (one for the buyer and one for the seller). Each circle in the figure represents an individual law firm; in period t , a transaction arrives and is assigned to representative law firms i and j (colored red for the buyer's counsel and green for the seller's counsel) with probability $p_{i,j}$.

FIGURE A1: TRANSACTION ASSIGNMENT IN EACH PERIOD t 

A. Nonprice-Term Selection

As noted above, each transaction arrives in the hands of the law firms with a default set of off-the-rack contract terms that presumptively apply to the deal. Such default terms, for example, may be those embedded in ABA model agreements or other well-known market templates in the field. That said, once the counsel have received a deal to execute, the legal teams can choose whether to (a) follow the conventional contract terms or (b) adopt a “mutation” that is inconsistent with convention.

To fix ideas, we suppose that the mutation will either increase or decrease the payoffs of both buyers and sellers by some fixed amount $\alpha > 0$. Whether the mutation increases or decreases both parties’ payoffs, however, may not be certain at the time of contracting, and we assume transactions come in one of two flavors. For the first (which we call “Type 1,” denoted T1), the mutation is value destroying, and each party loses α if the mutation is adopted. For the other flavor (which we call “Type 2,” denoted T2), the mutation is value enhancing and each party gains α . Thus, if the buyer and seller accurately identify which type of transaction

they are facing, adopting an efficient nonprice term (the conventional term or the mutation) is straightforward.¹⁶⁸

We assume, however, that such identification is not always possible—at least with precision. In our framework, the attorneys (and possibly even clients) have imperfect information about whether their transaction is a T1 or T2 transaction, and thus the best that they can do is assess a probabilistic likelihood about this critical piece of information. In making this assessment, transactional lawyers will draw on three pieces of information: (a) their prior beliefs about the overall representation of T1 and T2 deals, (b) their (potentially inaccurate) assessment of the type of the transaction they are negotiating, and (c) their collective experience in adopting (or rejecting) the mutation term in prior transactions. We address each of these below.

Before doing so, however, we first observe that because the parties are bargaining with symmetric (albeit imperfect) information, they will adopt the mutation if and only if—given their joint information at the time of bargaining—the mutation seems likely to bring about an increase in expected value with some critical probability (which we denote as q). Consequently, the decision about whether each bargaining team at time t will adopt the mutation turns on the information they have at the time about its net benefits (relative to the conventional term). This information set is the core vehicle through which actors learn in our model. In all our benchmark simulations, we will assume that $q = \frac{1}{2}$, and thus the parties will adopt the mutation whenever it increases joint expected payoffs.¹⁶⁹

We now proceed to describe the means by which the parties learn about transactions over time and from one another.

¹⁶⁸ This approach to a mutation is obviously a simplification, since many (if not most) alterations to nonprice terms seem likely to hurt one player and help the other. Such a caveat is easily accommodated in our framework at the cost of some additional notation. For example, our framework can be adapted to the situation where the mutation actually consists of *dual* changes to two nonprice terms—one of which helps the seller and the other of which helps the buyer. Under this account, the parties will horse trade to implement the dual changes if their joint effect is expected to be mutually beneficial. In such a scenario, one could reinterpret the value of the mutation to represent the joint gains from the dual mutation.

¹⁶⁹ If the parties are risk averse, the cutoff value for q might be larger than $\frac{1}{2}$. Our framework easily accommodates this possibility.

1. Prior beliefs.

We start with the parties' prior beliefs, which effectively reduce to the assessed likelihood that a randomly selected transaction is T1 or T2. This probabilistic assessment, of course, must be directly related to the proportion of potential deals that are of each type in the population. (For example, if 60% of the deals in the population of potential deals were T1, then it's pretty clear that a randomly selected deal from the population would have a 60% likelihood of being T1 and a 40% likelihood of being T2.) That said, within our framework, even this proportion is not known with certainty. Rather, we suppose that the true population characteristics could be skewed in either direction, so that a $\Delta\%$ fraction of the potential transactions are either T1 or T2, where Δ is a fixed parameter value such that $\Delta < 50\%$. More formally, if we let random variable Z denote the fraction of transactions that are T1 (and thus the complementary fraction $(1 - Z)$ is T2), then we suppose that there are two possible configurations to the world: either $(Z, 1 - Z) = (\Delta, 1 - \Delta)$ or $(Z, 1 - Z) = (1 - \Delta, \Delta)$. Significantly, however, the parties are uncertain about the realization of Z , and thus they do not know whether the Δ proportion applies to T1 deals (so that the majority $(1 - \Delta)\%$ of deals are of type T2) or to T2 deals (so that the majority $(1 - \Delta)\%$ of deals are type T1). Which of these alternative situations constitutes the "ground truth" cannot be resolved with certainty. But we assume that all players begin with a common population-wide prior probability about the world as follows:

EQUATION A1: PRIOR BELIEF THAT T1 DEALS ARE THE MINORITY

$$Pr \{Proportion\ of\ T1\ deals = \Delta\} = r_0$$

EQUATION A2: PRIOR BELIEF THAT T1 DEALS ARE THE MAJORITY

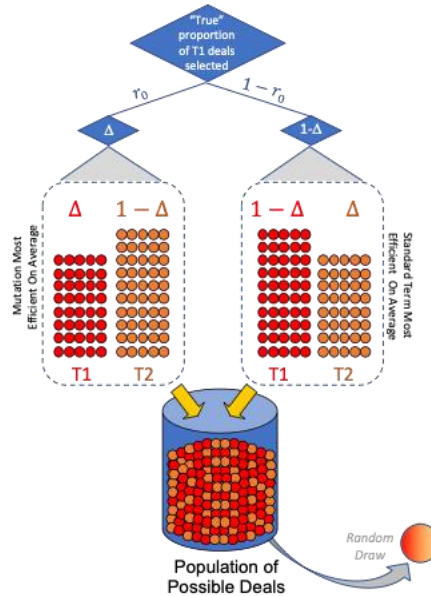
$$Pr \{Proportion\ of\ T1\ deals = 1 - \Delta\} = 1 - r_0$$

In other words, all parties believe that T1 deals constitute the majority of transactions with probability $1 - r_0$ and a minority of transactions with probability r_0 . Conversely, they believe that T2 deals constitute the majority of transactions with probability r_0 and a minority of transactions with probability $1 - r_0$. Although nothing in our model requires it, we initially assume that the conventional contract terms are there for a reason—and the parties' a priori assessment is that $r_0 < \frac{1}{2}$, indicating that most transactions are believed to be T1. Equivalently, then, the "conventional"

term is initially believed to be the most appropriate provision for most transactions. In our benchmark simulation, we assume that $r_0 = 0.05$ and that the relative percentage composition of T1 and T2 firms is 30% and 70%, so that $\Delta = 0.3$. Thus, in the benchmark case, there is a one-in-twenty chance that the mutation enjoys the 70–30 majority of potential deals, and a nineteen-in-twenty chance that the 70–30 split favors the conventional term.

The process is illustrated in Figure A2, which visually depicts this prior-belief process as well as the true state of play. In the figure, chance determines whether T1 deals (shown in red) constitute a majority $(1 - \Delta)\%$ of the population or a minority $\Delta\%$. The corresponding probabilities that T2 deals (shown in orange) are in the majority is r_0 , and, respectively, in the minority is $(1 - r_0)$. As can be seen from Figure A2, only if T1 deals are in the minority and T2 deals are in the majority (the left branch) will the mutation be, on average, value enhancing. Instead, if T1 deals are in the majority (the right branch), the conventional term will be (on average) the most efficient. The transaction that emerges is assumed to be a random draw from the resulting population of deals (whatever the ground-truth reality is on the mix of T1 and T2 representation).

FIGURE A2: SEQUENCE AND INFORMATION STRUCTURE



Absent any additional information, then, the parties would have to rely on their prior beliefs about the population averages

to determine whether the standard term or the mutation is appropriate. And if $r_0 = 0.05 < \frac{1}{2}$, as our benchmark example assumes, then they would never adopt the mutation. If, on the other hand, counsel could also draw on additional information that is probative of the deal before them, then their prior beliefs would inform—but would not fully determine—the contractual term chosen. How exactly the firm weighs prior beliefs against deal-specific information is described below.

2. Assessment of instant transaction.

In addition to their prior beliefs, the transacting parties are also able to assess certain “noisy” facts about the specific transaction before them, effectively obtaining an informative signal about which type of transaction they are negotiating. If this signal were 100% accurate, then it would overwhelm prior beliefs to the parties in structuring their contract, since it would allow them to design a contract that is a perfect fit to the type of deal. On the other hand, if the signal is noisy or the parties sometimes interpret the signal incorrectly, then they would tend to combine the content of the signal with their prior beliefs in a way to make an “all-things-considered” assessment of whether the mutation or the conventional term is warranted.

Thus, when a new transaction arrives and the buyer’s and seller’s counsel are selected, they jointly observe a noisy signal as to whether their particular deal is T1 or T2. The possible signal realizations are denoted as $t1$ and $t2$, where $\gamma \in (\frac{1}{2}, 1)$ embodies the signal’s precision, as per the following conditional probability table:

TABLE A1: DEAL-SPECIFIC SIGNALS AND TRUE DEAL TYPES
(PRECISION = γ)

↓Signal Observed \ True Type→	T1	T2
$t1$	γ	$1 - \gamma$
$t2$	$1 - \gamma$	γ

Note that when $\gamma = 1$, the signal is perfect, and thus the parties know precisely which type of deal they have before them. In contrast, when $\gamma = \frac{1}{2}$, the signal is wholly uninformative, and the parties cannot use it to refine their beliefs about the transaction.

For intermediate values of γ between $\frac{1}{2}$ and 1, the signal is partially informative, and the parties may use it (along with other information) to inform their beliefs. In our benchmark example, we will assume that $\gamma = 0.6$ so that the observed individual signal about the transaction is accurate 60% of the time and incorrect 40% of the time.

3. Prior experience of transacting law firms.

Finally, our framework presumes (like the real world) that counsel are repeat players in deal structuring, and they therefore bring their prior experiences and wisdom to the table. In particular, in addition to prior beliefs and their signal about the instant transaction described above, counsel are also able to look back to previous deals in order to further refine their experiential knowledge about the population, giving them added knowledge about when the mutation is (and is not) likely to be a good fit. Here, we assume that, for purposes of the instant transaction, counsel for buyer and seller are able to pool the signals that they have individually received from recent prior deals that their firms have negotiated. Such information would not be generally available to the public, but instead is housed in the institutional memory of the transacting firms. Here, we suppose that each side's legal team is able to look backward over a given number of periods at the deals (if any) that they played a role in negotiating. We denote the look-back period by the integer variable L ; for the buyer's counsel, we denote Y_b as the number of deals counsel was involved in during the look-back period, with k_b of those deals involving the observation of the $t1$ signal. Similarly, for the seller's counsel, we denote Y_s as the prior deals participated in during the look-back period, with k_s representing the number of times buyer's counsel has observed the $t1$ signal in those deals. At the negotiation table, counsel pool their collection of observations (adjusting as necessary the counts for any prior deals when the two firms negotiated with each other and thus observed the same signals). This process results in what is effectively a joint experiential data set for the negotiating parties, consisting of Y prior deals where the signal $t1$ appeared k times.¹⁷⁰ Although the values of Y and k_b will be dependent on the random matching of firms, we

¹⁷⁰ In all our simulations, we accounted for the possibility that the two law firms may have shared prior common deals, taking pains to avoid double counting such experiences.

assume in our benchmark model that counsel is able to look to the beginning of the simulation.

4. Updated posterior beliefs.

The three pieces of information noted above—prior beliefs (r_0), a noisy signal about the instant transaction (γ), and pooled information from prior transactions (Y, k)—allow the parties to refine and update their beliefs about the optimal term for the transaction that they are negotiating. In doing so, our baseline framework assumes that the parties use Bayes's rule to combine these pieces of information.¹⁷¹

Consider first how the parties might combine only their prior beliefs and their pooled information (disregarding the contribution of the signal they observe about the instant transaction). Here, applying Bayes's rule, it is straightforward to confirm that the parties would have the following interim beliefs about the population-wide ratio of mutation-favoring contracts:

EQUATION A3: UPDATED BELIEF ABOUT POPULATION

$$\hat{r}(r_0, \gamma, Y, k) = \frac{r_0}{r_0 + (1 - r_0) \left(\frac{1 - \gamma - \Delta + 2\Delta\gamma}{\gamma + \Delta - 2\Delta\gamma} \right)^{Y-2k}}$$

Although this interim belief does not yet incorporate anything about the signal that pertains to the instant deal, a few things are worth pointing out. First, when the contracting parties have prior experiences in negotiating this type of deal (so that $Y = 0$ and $k = 0$), the expression simplifies to $\hat{r}(r_0, \gamma, 0, 0) = r_0$. This makes sense, because a lack of prior experience implies that the best information the negotiating parties have is their *ex ante* priors. Similarly, note that when the signals that the parties observed from past deals are extremely imprecise ($\gamma = 1/2$), the expression similarly simplifies to $\hat{r}(r_0, 1/2, Y, k) = r_0$. This is also intuitive, since it means that the parties can learn nothing from their data set of prior signals. Finally, note that when r_0 takes on extreme values of zero or one (so that the parties have irrebuttably strong prior beliefs), no amount of prior experience will shake them from that view. Finally, note that in our benchmark model, this expression simplifies somewhat after plugging in the assumed values of r_0 and γ :

¹⁷¹ For a definition and explanation of Bayes's rule, see *supra* note 66.

EQUATION A4: EQUATION A3 FOR BENCHMARK MODEL

$$\hat{r}(0.05, 0.6, Y, k) = \frac{1}{1 + 19 \left(\frac{23}{27} \right)^{Y-2k}}$$

Now consider how the signal observed about the actual deal in front of the parties is combined with the probabilistic assessment from equation (2) of mutation-favoring deals. Because the signal reveals tailored information about the specific deal at issue, the parties would generate different “posterior” beliefs about whether the signal suggested a T1 deal (with signal $t1$) or a T2 deal (with signal $t2$). We can once again apply Bayes’s rule to each type of signal, as follows. If signal $t1$ was observed, then the parties’ posterior beliefs that the current deal is T1 are given by π_1 :

EQUATION A5: UPDATED BELIEF THAT SPECIFIC DEAL IS T1 IF
FIRM OBSERVES $t1$ SIGNAL

$$\pi_1 = \frac{1}{1 + \left(\frac{1-\gamma}{\gamma} \right) \left(\frac{\hat{r} + \Delta - 2\Delta\hat{r}}{1 + 2\Delta\hat{r} - \hat{r} - \Delta} \right)}$$

Conversely, if signal $t2$ was observed, then the parties’ posterior beliefs that the current deal is T1 are given by π_2 :

EQUATION A6: UPDATED BELIEF FOR SPECIFIC DEAL IS T1 IF
FIRM OBSERVES $t2$

$$\pi_2 = \frac{1}{1 + \left(\frac{\gamma}{1-\gamma} \right) \left(\frac{\hat{r} + \Delta - 2\Delta\hat{r}}{1 + 2\Delta\hat{r} - \hat{r} - \Delta} \right)}$$

Note that the only difference between these two posterior beliefs is the inversion of the likelihood ratio $\left(\frac{1-\gamma}{\gamma} \right)$ in the denominator. And, because $\gamma > \frac{1}{2}$, it follows that $\pi_1 > \pi_2$, implying (intuitively) that the parties’ belief about a T1 transaction (favoring the status quo term) should increase if they observe signal $t1$, and similarly their belief about a T2 transaction should increase if they observe signal $t2$.

Once again imposing the parametric values of our baseline simulation on these expressions, they simplify somewhat as follows:

EQUATION A7: EQUATION A5 FOR BENCHMARK MODEL

$$\pi_1 = \frac{21 - 12\hat{r}}{27 - 4\hat{r}}$$

EQUATION A8: EQUATION A6 FOR BENCHMARK MODEL

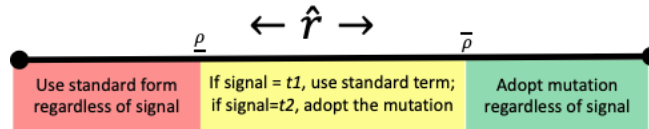
$$\pi_2 = \frac{14 - 8\hat{r}}{23 + 4\hat{r}}$$

5. Term adoption.

Given the information that they assembled through experience and direct observation, the parties will favor the mutation over the conventional term only if their posterior belief indicates that the likelihood of a T2 deal is sufficiently strong. Although we will explore alternative definitions of that concept below, we suppose for now that the key criterion is a more-likely-than-not criterion (which would coincide with designing a contract that is efficient in expectation). In some cases, the parties' joint experience may be so strong that it overwhelms anything that they might learn from the deal-specific signal they receive. In other cases, the signal is dispositive. Figure A3 illustrates this point by focusing on the strength of the parties' collective prior beliefs, or $\hat{r}$, based on their collective experiences. Note that when these beliefs strongly suggest that mutation-friendly deals are rare ($\hat{r} < \underline{\rho} < \frac{1}{2}$), the parties will generally favor the standard term regardless of the signal. In contrast, when their beliefs strongly suggest that mutation-friendly deals are very common ($\hat{r} > \bar{\rho} > \frac{1}{2}$), they will similarly favor the mutation regardless of the signal. When their prior beliefs are more moderate, however ($\underline{\rho} < \hat{r} < \bar{\rho}$), the parties' choice of term will hinge on the signal they observe (with $t1$ favoring the conventional term and $t2$ favoring the mutation).¹⁷²

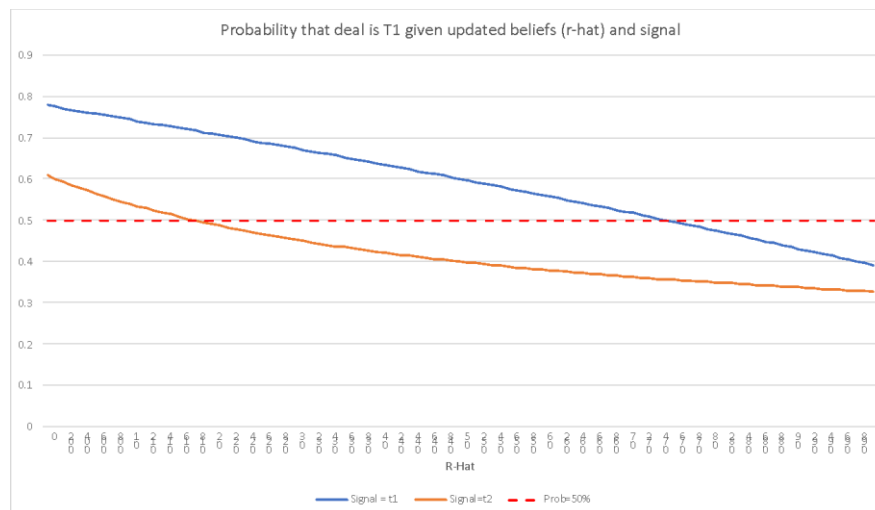
¹⁷² It is easily confirmed that $\gamma^{-1/2}$ and $1-\gamma^{-1/2}$.

FIGURE A3: JOINT BELIEFS AND SIGNAL DEPENDENCE



In our benchmark model, this set of trade-offs can be easily illustrated using Figure A4. The horizontal axis denotes the updated beliefs, $\hat{r}$, that the parties have coming into bargaining based on their joint prior transactions (per Equations A5–A6 above). The blue line denotes the posterior assessment they would have that the transaction is a T1 transaction after having observed a $t1$ signal, while the orange line denotes the posterior beliefs that the transaction is T1, having observed a $t2$ signal. Note that if their updated beliefs are below approximately $\hat{r} = 0.17$, the parties will always adopt the conventional term regardless of signal. Conversely, if their updated beliefs are above a cutoff of approximately $\hat{r} = 0.75$, they will always adopt the mutation. For intermediate values, their signal dictates the transaction that they enter into.

FIGURE A4: INTERIM AND POSTERIOR BELIEFS, AND TERM ADOPTION (BENCHMARK CASE)



Collecting all the insights from above, we arrive at the following proposition:

Proposition: *Consider a pair of negotiating parties at round t with joint signal history $\langle k; N \rangle$ as derived above. The parties will choose the relevant nonprice contract term as follows:*

- *If $\hat{r} > \bar{\rho} > \frac{1}{2}$, the mutation is chosen regardless of the signal observed.*
- *If $\hat{r} < \underline{\rho} < \frac{1}{2}$, the conventional term is chosen regardless of the signal observed.*
- *If $\underline{\rho} < \hat{r} < \bar{\rho}$, the mutation is chosen if and only if the parties observe signal $t2$,*

where $\bar{\rho} = \frac{\gamma-\Delta}{1-2\Delta}$ and $\underline{\rho} \equiv \frac{1-\gamma-\Delta}{1-2\Delta}$.

The expressions from the above proposition drive each of our simulation paths presented in the main text.