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Contractual Evolution

Matthew Jennejohn  
*Brigham Young University J. Reuben Clark School of Law*, jennejohnm@law.byu.edu

Julian Nyarko  
*Stanford Law School*, jnyarko@law.stanford.edu

Eric L. Talley  
*Columbia Law School*, etalley@law.columbia.edu

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Contractual Evolution

Matthew Jennejohn,* Julian Nyarko** & Eric Talley***

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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 real-world dataset of over 2,000 merger agreements negotiated over the last two decades, tracking the adoption of several contractual clauses, including pandemic-related terms, #MeToo provisions, 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 appear manifest in varying strengths across differing circumstances. We highlight several constructive applications of our framework, including 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.

* Professor of Law, BYU Law School.
** Assistant Professor of Law, Stanford Law School.
*** Isidor & Seville Sulzbacher Professor and Faculty Co-Director of the Millstein Center for Global Markets & Corporate Ownership, Columbia Law School. The authors thank workshop participants at Duke Law School for helpful comments on this project. Jamie Brumberger, Kai’anui Graham, Madisyn Klein, Emily Park, Tanner Schenewark, and Jessica Volmar provided excellent research assistance. Special thanks to Annalee Hickman for exceptional library support. All errors remain the authors’.
Introduction

Most corporate transactions win deservedly scant attention in the popular press. But every so often, one becomes the centerpiece of cocktail-party conversation. And just such a deal came along in November 2019, when iconic U.S. luxury goods maker Tiffany & Co. disclosed that it was being acquired in a $16.2 billion transaction by Louis Vuitton Moet Hennessy (“LVMH”), the French luxury goods giant.¹ When the tie-up was announced, there 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 by LVMH’s Chairman, Bernard Arnault, whose storied deal-making had fortified the LVMH empire.³ If there were any questions 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. Many of LVMH’s and Tiffany’s locations were shuttered by state and local authorities, with no dependable timeline for reopening. A transaction that once looked like a rocket ship now more closely resembled a train wreck, with many observers quietly predicting that LVMH would start looking for a way out.

In the end, it was not love that prevailed; rather, it was a contract. Buried deep within the 70-page agreement that memorialized the LVMH-Tiffany merger was a provision that provided LVMH with the potential offramp it so desperately sought. One of the conditions to LVMH’s obligation to close the transaction was that Tiffany’s business would not have experienced a “material adverse effect,” the equivalent of a *force majeure* (or “Act of God”) provision that appears in myriad other contracts. LVMH seized upon the language, declaring that the pandemic had, in fact, visited a material adverse effect on Tiffany’s operations, and LVMH therefore had the right to walk away from the deal.

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Tiffany responded the way that jilted lovers sometimes do: by litigating, in the Delaware Court of Chancery, where it argued that the force majeure provision had several exclusions that prevented LVMH from treating COVID-19 as a material adverse effect. 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 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.

Holding aside the merits of these arguments, the overall economics of the merger still appeared strong, and the costs and risks of litigating the outcome were appreciable. It was therefore unsurprising that in late 2020, the parties returned to the negotiating table to re-cut 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. Although Tiffany’s dowry had shrunk considerably, it was not to suffer the Whistledown-worthy humiliation of being left at the altar.

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 material adverse effect claims. And beyond the context of

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mergers and acquisitions ("M&A"), similar claims arising out of changed circumstances increased dramatically in many commercial and non-commercial settings, ranging from supply chains to higher education to Hollywood.\textsuperscript{17}

For lawyers and those studying the law, part of the allure behind these disputes stems from their foundational origins in basic contract law. Whether it pertains to a corporate combination,\textsuperscript{18} a conceiving cow,\textsuperscript{19} a closed canal,\textsuperscript{20} or a cancelled coronation,\textsuperscript{21} courts have long struggled to assess whether, when and how the law should intervene in a contractual risk allocation during moments of unanticipated surprise or severe economic dislocation.\textsuperscript{22} But the role of the law in this process is not limited to litigated outcomes. Even before the phalanx of Tiffany/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: The choices made by these transactional attorneys can tip the balance of risks and incentives for trillions of dollars’ worth of agreements as economic conditions change. And in doing so, drafters must carefully consider whether a fluidly evolving environment requires them to write new, yet-untested provisions to address each emerging risk. Interestingly, the lawyers making these decisions often work alone, with little input from other stakeholders such as CEOs, CFOs, boards or investment bankers. When lawyers hammer out these terms, those other stakeholders have long left the

\begin{itemize}
\item \textsuperscript{18} Hexion Specialty Chem’s., Inc. v. Huntsman Corp., 965 A. 2d 715 (Del. Ch. 2008).
\item \textsuperscript{19} Sherwood v. Walker, 66 Mich. 568, 33 N.W. 919 (Mich. 1887).
\item \textsuperscript{20} Transatlantic Financing Corp. v. United States, 363 F.2d. 312 (D.C. Cir. 1966).
\item \textsuperscript{21} Krell v Henry, 2 KB 740 (1903).
\item \textsuperscript{22} Victor P. Goldberg, \textit{Price Adjustment in Long-Term Contracts}, 1985 WISC. L. REV. 527 (1985)
\end{itemize}
negotiation 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, choice-of-forum provisions, financings, and countless other contracts where performance takes place far into an uncertain 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.

And 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. 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 (non-price) terms within contracts are generally not part of the discussion. And yet, 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. Others have countered that contracts simply do not have the same exposure to market dynamics, with some advancing the thesis that evolutionary movements are virtually non-existent, displaying a staunch rigidity akin to a “black hole.” Yet others have used nearly the same observation about the lack of market discipline to argue in favor of a “churning”

25 LEON WALRAS, ELEMENTS OF THEORETICAL ECONOMICS (1900); Gérard Debreu, Excess-Demand Functions, 1 J. MATH. ECON. 15 (1974); Hugo Sonnenschein & Wayne Shafer, Market Demand and Excess Demand Functions, 2 HANDBOOK OF MATHEMATICAL ECONOMICS 671 (1982).
26 See, e.g., Alan Schwartz & Robert E. Scott, Contract Theory and the Limits of Contract Law, 113 YALE L. J. 541 (2003). This 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.
effect, with rapid mutations that reflect incentives of the drafters that stand in direct conflict of their clients’ interests. Some have even proposed that transactional lawyers make unnecessary modifications simply to increase their billable hours.\textsuperscript{28}

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?

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

In this Article, we marshal both theoretical and empirical tools to study contractual evolution.\textsuperscript{29} On the theoretical side, we develop a general, holistic model of contract structuring where contract provisions are progressively embraced or abandoned by 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 them a conduit to transmit their experiences to one another, as well as to sharpen


their expertise. Using simulations to analyze our model, we generate several predictions about how mutations are likely to manifest over time. But our exercise extends beyond simulating outcomes from a model. In a second step, we export the intuitions acquired from our simulations into a real world. Using a large dataset of over 2,000 M&A transactions that we hand collected and labeled, we track the evolution of a series of important contract innovations and the degree to which they are embraced or rejected by the networks of lawyers who structure them. Our analysis strongly suggests that not all contract terms are created equal within our research design, and that the evolution of contract terms is more likely to be temporary or truly 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 differing accounts of contract term evolution in the legal literature. Part II introduces our own theory and model of contract evolution. 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, where 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, which specify an amount the buyer is to pay the target company if the buyer terminates the deal for certain reasons. #MeToo provisions have been made against targets in the securities industry by the Committee on Foreign Investment in the United States, and some courts have also enjoined such language. Not only is it included in a contract, but also when it is left out.

Foremost, our analysis can highlight when and whether lawyers add significant value to deals. They also help us to 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 truly durable contributions. Some terms may be more likely to be highly bespoke. In addition, some diffusion paths combine more than one pattern, such as where a shock upends existing practices and spurs new innovation in the market. Our analysis suggests that the distinct evolutionary paths identified by our model also play out in actual market practice. The remainder of this paper proceeds as follows. Part I provides an overview of differing accounts of contract term evolution in the legal literature.
termination fees. Our analysis confirms that there is great heterogeneity in the diffusion paths of our example terms, and a single 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 section 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. 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, for the rest it is still common to think of large transactions of significant size to 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 did their predecessors, doing so seems hardly to describe a diffusion process. By definition, tailoring a contract to each specific 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 Newton and Leibniz each independently stumbled upon key principles of calculus in the 17th century.

However, even for large, seemingly bespoke deals, 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/or emulating contractual language from one deal to the next. First, reusing “boilerplate” language allows the designer to exploit economies of scale, like Ford Motor Company accomplished a century ago with the standardized design of the Model T. 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.

Second, standardized contract language can lead to greater certainty in interpretation should a dispute about the language land in front of a court or arbitrator. Judicial precedents are a public good, and consequently familiar terms have a much greater chance of being able to draw on such interpretive jurisprudence with confidence. Courts have long been cognizant of this externality of precedents, and they have emphasized the importance of uniformity and predictability of boilerplate language—a benefit that is not lost on contracting parties as well.34

Finally, the evolutionary path of contract 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.”35

By the same token, standardization will necessarily cause the language of a contract to diverge from specific intentions of the parties to the agreement.36 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.37 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.

What factors lead to path dependency in some situations but rapid evolution and diffusion in others? The research on that question has produced a number of 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 chance 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

34 See, e.g., Sharon Steel Corp. v. Chase Manhattan Bank, N.A., 691 F.2d 1039 (2d Cir. 1982).
37 Marcel Kahan & Michael Klausner, Standardization and Innovation in Corporate Contracting (or "The Economics of Boilerplate"), 83 VA. L. REV. 713, 727 (1997).
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” approach. We discuss each in turn below.

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

The first category, which has attracted the greatest amount of recent scholarly attention, focuses 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.38

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.39 One reason is familiarity: As it becomes more widely adopted, the value of a contract term 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.40 A related reason for lock-in is that deviations from standard, or “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 their contractual obligations is not easily observed. If a party proposes a novel formation of a standard contractual term during negotiations, their counterparts may become suspicious that the non-standard proposal is indicative of an undisclosed (and therefore likely negative) hazard.41 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.42 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.43 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,

38 Gulati & Scott, supra note 35.
39 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. Douglas Gale, Standard Securities, 59 THE REVIEW OF ECONOMIC STUDIES 731–755 (1992); Marcel Kahan & Michael Klausner, Standardization and Innovation in Corporate Contracting (or “The Economics of Boilerplate”), 83 VA. L. REV. 713, 730 (1997).
40 Gale, supra note 39.
41 Id.
43 See Gale supra note 39.
the costs of such coordination increase, and shifting the market to a new equilibrium may be prohibitively costly without a formal institution, such as a trade association, to facilitate.44

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 sub-strand of research emphasizes what might be considered the contractual “production process” within law firms. This work argues that how 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 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, which are now readily available on the SEC’s Edgar database of public filings and commercial databases. Deal lawyers may use portions of those precedent agreements wholesale—contract

44 Empirical research has identified two primary 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, 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. Stephen J. Choi, Mitu Gulati & Robert E. Scott, The Black Hole Problem in Commercial Boilerplate, 67 DUKE L. J. 1, 38-40 (2017) (discussing the role of a set of meetings among major market participants, the first of which held at Columbia Law School, played in coordinating the shift to a new contractual standard); Stephen J. Choi et al., The Dynamics of Contract Evolution, 88 NEW YORK UNIVERSITY LAW REVIEW 1, 23 (2013) (discussing role of the International Monetary Fund in coordinating the shift to a new contractual standard); Stephen J. Choi et al., The Evolution of Contractual Terms in Sovereign Bonds, 4 JOURNAL OF LEGAL ANALYSIS 131, 162 (2012) (same); Stephen J. Choi & G. Mitu Gulati, Innovation in Boilerplate Contracts: An Empirical Examination of Sovereign Bonds Conference on Sovereign Debt Restructuring: The View from the Legal Academy, 53 EMMORY LAW JOURNAL 929, 935-36 (2004) (discussing role of the IMF and other major institutions in coordinating a shift to a new contractual standard).

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 simultaneous shock on both the corporate bond market and the acquisition market for privately-held companies found that adoption of a new contract term began almost immediately in the privately-held company acquisition market, where participation is concentrated and coordination costs therefore low. At the same time, change in corporate bonds was much more gradual in comparison. Robert E. Scott et al., Revising Boilerplate: A Comparison of Private and Public Company Transactions, 2020 Wis. L. REV. 629–656 (2020).
design by Copy and Paste.\textsuperscript{45} Or they may use precedent as a starting point, tweaking it in subsequent iterations.

The reason for reusing boilerplate may express 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 personal exposure to blame if a problem between the contracting parties later arises.\textsuperscript{46}

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.\textsuperscript{47} Devoid of real intent, the term functionally becomes a “contractual black hole.”\textsuperscript{48}

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 the reasons to do so are do not further the clients’ interest. Under this accounting, contractual innovation is “too hot.”

One formulation of its 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 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 simply for the sake of change, 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. In the limit, such strategic tailoring may represent “churning” a contract by adding immaterial adjustments to justify time that will be billed to a client.\textsuperscript{49}

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 deals terms on the margins leads to an increase of diversity in the market. Anderson & Manns, for instance, depict developments in

\begin{footnotesize}
\textsuperscript{46} Gulati & Scott, \textit{supra} note 35.
\textsuperscript{47} Stephen J. Choi et al., \textit{Variation in Boilerplate: Rational Design or Random Mutation?}, 20 \textsc{American Law and Economics Review} 1–45 (2018); Gulati & Scott \textit{supra} note 35.
\textsuperscript{48} Stephen J. Choi et al., \textit{supra} note 27.
\textsuperscript{49} Anderson & Manns, \textit{supra} note 28.
\end{footnotesize}
contract terms as “phylogenetic trees” that reveal the incremental change of terms over time.\textsuperscript{50}

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 exigencies and needs at the time. Not only does this account comport with the neoclassical economics view of contracting,\textsuperscript{51} but it also aptly describes a long and pedigreed account of corporate law in general.\textsuperscript{52} In the context for M&A transactions, there appears to be some support for this theory as well. For example, Coates finds evidence that M&A agreements are neither fully customized to each deal nor completely boilerplate, exhibiting a type of “constrained variation.”\textsuperscript{53}

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 in turn 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.\textsuperscript{54} Alternatively, industry trade associations may be particularly effective in reducing the coordination costs that impede contractual innovation, as discussed above. Bernstein’s classic studies of industry associations in a variety of commodity industries regularly updating standardized form contracts provide one such example.\textsuperscript{55}

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, as it suggests that any evident lock-in might simply be an optimal gravitation to a provision that is categorically value enhancing.

\textsuperscript{50} Id.


C. 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 upon the unique bargaining dynamics between the parties that negotiate it, a setting that may itself change over time. Yet each the various accounts above suppress 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, lawyer’s 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 the diametric opposite of contract economics’ message: Contracts are not expressly bargained for; rather, they are the result of a production process, with bargaining dynamics sitting offstage.

Holding 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 them into a coherent theory that can explain how the factors 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. 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, exhibiting rather “constrained variation.”

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

58 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 Nyarko, supra note 24 (analyzing choice of forum provisions in a sample of half a million agreements spanning a number of industries).
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, can capture dynamics across a variety of agreement types and terms, and can be deployed across 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 Section 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 we present below is quite general, and it advances a mechanism for contract term evolution that plausibly applies to any contractual scenario where legal actors play a pivotal role in contract design.

Before proceeding, we pause briefly to address our methodological approach in this section, which 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 literature still lacks a unified theory of contract term evolution. Part of that lack of unity stems from the absence of a single framework within which to evaluate each account. And this is where formal models can provide great utility.

To be sure, formal models frequently attract criticism because they are said to be unrealistic, given that 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 train focus on a limited set of core phenomena that are of interest, isolating them from other factors that are either unrelated or less pertinent to the inquiry at hand. Doing so often reveals intuitions that would be harder to discern and understand if not viewed in isolation. 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—for that would defeat the purpose of developing clean intuitions. Consequently, this part substantially 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 is a contract repeatedly. For each such transaction, the buyer and seller retain a sophisticated law firm to represent their interests, delegating to them the task of negotiating many of the transactional details outside of price. In contrast to 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 a “Material Adverse Effect” (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 typical example of such an MAE clause (edited for clarity):

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

The excerpted passage is structured in a way such that the many—but not all—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 a material adverse effect; meaning that such risks are effectively born by the buyer. In our example, the buyer is not allowed to walk away from the deal if the effect also impairs the economy or other peer firms in the industry. These latter exclusions are popularly known as “MAE carve-outs.”

To add some contextual color, suppose the first transaction in this sequence is negotiated in late 2019, just as news of the COVID-19 virus were beginning to spread.60 Cognizant of the nascent risk, counsel for the seller deliberate whether to propose a deviation from the standard MAE, inserting “pandemics” as an explicit MAE carve-out. From the seller 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 carve-out will come at a cost. First, it calls attention to the emergent hazard, which is significant if buyer’s counsel were not already aware of

the risk. Second, counsel for the buyer would likely be unwilling to accept a pandemic carve-out without extracting a buyer-friendly provision as a quid pro quo.\textsuperscript{61} Third, enumerating a “pandemic” expressly as a MAE carve-out could have unintended consequences as to other unanticipated changes. If, say, some distinct disaster eventuates (e.g. an asteroid hitting the 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 other non-pandemic risks were intentionally excluded and should be treated differently.\textsuperscript{62} By including an explicit pandemic carve-out, then, seller’s counsel might unwittingly amplify the likelihood that a court will assign other, non-enumerated risks to the seller (e.g. “terrorism”). Given all of these uncertainties, the seller’s counsel may have difficulty determining with certainty the value of the pandemic carve-out. 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 carve-out) 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.\textsuperscript{63} Once two firms are selected, they negotiate over whether to retain the traditional term or whether to adopt the new explicit carve-out provision. Their final decision is influenced by several considerations, including their general beliefs, the knowledge and experience they gained from prior deals, and their (possibly imprecise) impressions of the economics of the deal in front of them. We will detail each of them 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 carve-out would represent a net cost, effectively


\textsuperscript{62} This interpretive canon, sometimes known as \textit{Ejusdem Generis}, states that when there is an enumerated list of examples, such lists should be read to limit the reach of more general terms. \textit{See}, e.g., State v. Russell, 187 So. 540, 543 (Miss. 1939); \textit{see}, e.g., Witherspoon v. Campbell, 69 So. 2d 384, 388 (Miss. 1954).

\textsuperscript{63} In our baseline simulations, we will arbitrarily set the number of law firms to 10 for expositional purposes. Our model allows the number of law firms to be set at any positive, non-zero integer.
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, or $(100% - z)$, the new mutation would create value. Such a situation might describe scenarios in which the seller is the superior risk bearer or the uncertainties about legal interpretation are low. Significantly, however, we further assume this key proportion $z$ is itself not known with certainty but could take on one of two profiles. Either (a) the population tends to favor the conventional term, such that $z = 70\%$ (and $1 - z = 30\%$); or (b) it tends to favor the mutation, with $z = 30\%$ (and $1 - z = 70\%$). Regardless of which direction the populations 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 itself is not 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 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 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%.\(^{64}\)

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. This point is trivially true in many ways. 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 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 or not to adopt the mutation.

\(^{64}\) That is, $0.95 \times 30\% + 0.05 \times 70\% = 32\%$. 


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. 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 best adapted to the conventional term or a new term. Here, we would not expect that other information pertaining to the population-wide distribution of deals had any consequence. The attorneys would craft the deal in a way that is best suited to the deal in front of them. On the other end of the spectrum, suppose the deal signal wholly uninformative, and was 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 right 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 inform their actions the deal in front of them. As we show below, this possibility gives rise to an interesting learning dynamic where the lawyers may sometimes be guided by their knowledge about the population, and sometimes be guided 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 deal-making. 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. As lawyers negotiate more and more deals over time, they begin to amass their own collection of prior signals 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 the mutation increases or decreases their contractual surplus.

In our illustrative example, the lawyers may over time observe that deals incorporating the mutation 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 over time 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 lawyers to inform their transaction collaboratively. Here, we assume that lawyers can draw on their past experiences—in particular signals they have observed from prior deals—to update their beliefs about how
prevalent mutation-favoring deals are in the population. Specifically, we suppose the lawyers negotiating each deal are able to pool their observations from prior deals to further refine their assessment of the overall population through Bayesian updating. This assessment is then combined with the signal they observe in the instant deal, and the parties will favor the mutation if and only if they believe 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 propagate an assortment of diffusion patterns. We begin by briefly illustrating and discussing the role 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 a mathematical parameters (column 3). When a parameter is involved, we also specify the value we assign to it in our baseline analysis (column 4). For instance, the first row in the below table suggests that we denote the number of law firms with the symbol $N$ and that we set it to 10. This means that, in our baseline model, the parties choose from a pool of 10 law firms.

To develop intuitions about the diffusion paths, we use the parameter values from the Table to simulate a series of 2,000 sequential deals (or “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 rerun the 2,000-round simulations repeatedly in order to assess the average tendencies of the diffusion paths over time. In all the simulation diagrams below, we have rerun (or “iterated”) the simulation 100 separate times.

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65 The term “Bayesian” refers to a well-known relationship in probability theory governing how a rational decision maker (“she”) marshals available information to update her probabilistic beliefs about the world. The process of updating follows what is known as “Bayes’ 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:

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

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Parameter</th>
<th>Benchmark Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A one-shot buyer and a one-shot seller choose their counsel from a pool of repeat-play law firms</td>
<td>Number of Law firms = ( N )</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>The lawyers negotiate over 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</td>
<td>Fraction of deals favoring the conventional term = ( z ); Proportion favoring the mutation = ( 1 - z )</td>
<td>0.3 (or 30%)</td>
</tr>
<tr>
<td>4</td>
<td>Lawyers share prior beliefs that the population is on balance best adapted to the mutation</td>
<td>Prior beliefs = ( r_0 )</td>
<td>0.05 (or 5%)</td>
</tr>
<tr>
<td>5</td>
<td>Lawyers assess whether specific deal in front of them is best adapted to mutation or conventional term</td>
<td>Accuracy of the inference by the lawyers = ( \gamma )</td>
<td>0.6 (or 60%)</td>
</tr>
</tbody>
</table>

*Table 1. Key Parameters for Term Evolution Simulations (Benchmark Case)*

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 of the opposite, and 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 incrementally build prior 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.
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% adoptions. The reason for this overshooting is simple: In our baseline simulations, lawyers do not have particularly good skills of discerning deal-specific information – the signal they observe is only 60% accurate, meaning that lawyers have only modest confidence in their ability to diagnose the specific deal in front of them. In an environment of such contract-specific uncertainty, they 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 every one of their deals.

2. The Strength of the Prior Belief ($r_0$)

Another key factor in the diffusion path is what belief the lawyers hold initially. 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 are more quickly to adopt the new mutation, relative to
the benchmark case. Although this point might seem intuitive, we believe 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, specialized experts (e.g., boutique firms) may have hold 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](image)

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 concerns the size of the law firm market. In our benchmark simulations, we assumed that there are $N = 10$ law firms that the parties randomly choose from. 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](image)
As is clear from the Figure, smaller markets lead to faster adoption, while large 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. In the left panel ($N = 3$), for instance, 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, in highly concentrated industries where legal services are provided by a handful of firms, adoption of a mutation can occur at much greater pace than if 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 Elizabeth de Fonteney points out that one advantage of hiring such firms could be their accumulated expertise and precision in pricing deals. Our findings formalize and add to those of de Fonteney. In particular, we show formally that, through repeat interaction, large firms may be better positioned to identify promising mutations in contractual language and differentiate between those that increase the surplus for the clients and those that decrease the surplus. We highlight, however, that this effect could be somewhat counteracted by if large firms hold particularly strong and incorrect beliefs about the value proposition of a mutation.

4. The Accuracy of the Signal ($\gamma$)

Another determinant of diffusion paths concerns 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 upwards 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 nothing can be learned from the signals observed in current or prior deals (lower panel).

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Note that a slight increase in signal precision (upper left) enhances the pace at which the mutation is adopted. We believe this to be 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 1, 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. Here, the signal from the deal is accurate enough to make obsolete any population-wide information 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 at 0, indicating that law firms do not even experiment with adopting the mutation. This makes intuitive sense, since here the signal is random noise. With nothing to learn from current or prior

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67 The mean adoption rate is not exactly at the efficient level of 0.7, but slightly below it. This is because lawyers still have a strong prior that the mutation is value decreasing.
signals, lawyers in each round tether their decisions to their prior beliefs about the population.

5. Special Cases

In addition to changing around 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 adoptions patterns change after the shock. Although several such shocks are conceivable, we concentrate on two of them below: Regime Shocks, and Information Shocks.

**Regime Shocks**

A “regime shock” refers to a scenario in which the population-wide net costs and benefits from the mutation suddenly shift. In the case of our example, such a shock may take the form of a sudden arrival of vaccines or herd immunity, which alter value proposition for including a pandemic exclusion in the contract.\(^{68}\) Alternatively, a regime shock might constitute the enactment of a new law or judicial decision that establishes a new precedent in how a mutation is interpreted by the courts.\(^{69}\)

**Figure 5** depicts two different types of regime shocks. In the first (left panel), we introduce a shock in round 1000 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 to a change in precedent.\(^{70}\) 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

\(^{68}\) Another particularly visible example (and one 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. While traditionally, it was assumed that #MeToo representations are 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 overall value enhancing increased dramatically and suddenly.

\(^{69}\) 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 only be sued in their principal place of business or their state of incorporation. 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.

\(^{70}\) In our model, we assume that parties slowly update their beliefs, rather than observing the change and immediately correcting course. This is consistent with other findings in the literature, which have found that drafting practices can often be sticky. Nyarko, Stickiness, supra note 24 (“Suggesting that the use of templates may slow down the pace of adaption”); Kahan & Klausner, supra note 37 (“Arguing that network effects may induce some amount of stickiness.”); Gulati & Scott, supra note 35 (“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.”)
regime change is immediately observable, an assumption consistent with regime changes induced by many highly publicized events.

From both simulations, it is clear that parties begin to adjust their behavior when the shock occurs. In the left panel, what had been a growing trend towards adoption suddenly changes course, and parties increasingly reject the mutation as they observe increasing transactions poorly adapted to it. In the right panel, the lawyers initially stick with the conventional term while it is dominant, but then 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 of the above scenarios, the eventual diffusion pattern that takes hold has the effect of overshooting the true population composition. Attorneys thus use their dealspecific information to adjust their overall expectations, but over time tend to set it aside with individual contracts, emulating the emergent norm.

**Information Shocks**

A second type of shock concerns not the underlying contracting environment but rather a shock 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, but at most was shared with the contractual partner in their current deal. This is often a reasonable assumption since both rules of professional conduct and private reputation building incentives would tend to induce lawyers to keep client-specific information close to their chests.\(^71\)

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\(^71\) See American Bar Association, Rules of Professional Conduct Rule 1.6.
That said, in certain contexts, private information is pooled effectively for public consumption. For instance, in the M&A industry, the American Bar Association conducts “Deal Points Studies” at regular intervals. For these studies, the ABA collects information from merger agreements that parties have previously disclosed to the Securities and Exchange Commission. It then shares this information, including current trends in the adoption of certain contractual provisions, with the industry at large. Other examples include academic studies that examine contractual practices. The release of information collected in these studies can be considered “information shocks” during which the private deal making practices of the 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 following way: In round 200, we assume that all law firms receive credible information about the adoption pattern in all prior rounds. They then run “internal simulations” to assess what diffusion path would have looked like if $z = 30\%$ and what it would look 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, the lawyers update their baseline prior belief accordingly, so that it incorporates all signals contained in the information pooling event.

In the left panel of the Figure, 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 or not other drafters believe their deals to benefit from the mutation. It also makes public who has chosen to adopt the mutation so far. As can be seen, the intervention suddenly and significantly increases the adoption rate in comparison. 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 Figure 6 (right panel), we assume that the information shock releases incorrect information. One can imagine several reasons for why this may...
happen. For instance, 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 EDGAR database. In it, interested parties can find “material contracts” concluded by publicly registered companies. However, many types of transactions are not represented in that database. For instance, deals between private companies or those involving smaller stakes cannot be absent. Those who seek to pool information, such as the ABA, additionally limit their sample, e.g., by only including M&A transactions that exceed 100 million dollars. If skewed samples incorrectly represent the entire population of deals, there is the danger that parties draw incorrect inferences from the pooling intervention.

As shown in Figure 6 (right panel), such incorrect pooling of information generally delays the adoption of a mutation. However, absent extraordinary circumstances, parties will eventually accumulate sufficient representative signals in their own practice to overcome the incorrect inference they drew from the pooling event. This is significant, because it suggests, although incorrect information causes some harm to the adoption practice, drafters’ experience ultimately prevails.

III. Applying the Model: Examples of Term Diffusion 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 section, we turn to applying the model to real world data of contractual evolution in the M&A market. Specifically, we focus on a collection of 2,141 M&A for deals in excess of 100 million dollars 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 word diffusion pattern maps exactly into 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 real world, complex data sets. As such, the evidence presented in this section 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 of diffusion and diagnose the normative desirability of the observed trends. Perhaps most importantly, we find that the merger agreement provisions we study do not all follow a single evolutionary trajectory from any one of our simulations. Rather, our analysis finds that some practices appear to follow one pattern, while others follow

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72 If r0 takes the extreme value of 0 or 1.
a different one. Our conclusion from this comparison is that the contractual evolution in the M&A market is far from homogenous.73

Merger agreements are rich in dimensionality, typically containing a great number of provisions spanning dozens (if not hundreds) of pages.74 We focus here on a discrete subset of notable terms: (1) pandemic-related force majeure provisions, (2) #MeToo (or “Weinstein”) provisions, (3) CFUNDUS provisions, (4) reverse termination fees, (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 as exemplars of diffusion, mutation and evolution over the last few decades.

In the subsections below we consider whether and how the reception of each term matches up with our modeling predictions. Each of the following subsections, then, first provides a brief description of each term we study, and 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, hand-collected database of 2,141 definitive merger agreements spanning nearly two decades,75 which we have hand labeled for the existence of several provisions.

1. MAEs/Pandemic Carve-Outs

The Material Adverse Effect or Material Adverse Change (“MAE” or “MAC”) provision is a staple of any M&A transaction, used to allocate risk and provide grounds for terminating a deal in the event certain unforeseen circumstances occur.76 The basic MAE provision defines the MAE (somewhat

75 We hand-collected all M&A contracts for deals valued above $100 million and publicly available on the Security and Exchange Commission’s website from 2003 through the first half of 2020.
circularly) as “any event, circumstance, development, or condition occurring that has already had, or would be reasonably expected to have, a [MAE] on the target.” 77

This language is then typically followed up with a list of carve-outs or exceptions that—notwithstanding the foregoing language—would not constitute an MAE—i.e., these enumerated events do not constitute sufficient grounds for termination. Carveouts can be quite general (e.g., including general macroeconomic or governmental events), or specific (e.g., natural disasters, climate change, and other industry-specific risks). 78 Finally, the MAE might also provide exceptions to the exceptions (sometimes called “carve ins”), stating that any of the MAE exceptions could still constitute an MAE if, for instance, it has a disproportionate impact on the seller as compared to other companies in the seller’s industry. 79

Generally, the term “material” in a MAE provision is not defined, 80 so guidance on what actually constitutes an MAE sufficient to justify termination of a deal comes almost entirely from the courts. In 2001, the IBP shareholders’ litigation 81 provided the now-standard interpretation of MAE clauses, reading the provision as incredibly seller-friendly and making three important findings: first, that “a general economic or industry decline […] could not alone constitute a MAC […] [thus] the purchaser must show that the ‘required materiality of effect’ on the target.” 82 Second, the court found that “contractual language […] must be interpreted in light of the ‘negotiating realities’ and larger context in which the parties were contracting,” 83 further noting the difference between financial and strategic buyers in a MAE context. 84 Third, the court noted that “the decision ultimately boiled down to a question of public policy, […] [and that] would likely require the purchaser to make a strong showing before allowing it to invoke a MAC exception to its obligation to close.” 85 Indeed, the Court of Chancery in In re IBP

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79 Id.

80 Id. at 773.


82 Id. at 779 (quoting IBP, 789 A.2d at 71).

83 Id., at 779 (quoting IBP, 789 A.2d at 67).

84 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 Strine opined on the difference between financial and strategic buyers in IBP, stating: “it 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.” IBP, 789 A.2d at 67.

85 Monson, supra, at 779.
declined to find that a MAE had occurred. In that respect, the case was a harbinger: Buyers’ attempts to argue that a material adverse effect had occurred in subsequent cases would regularly founder on the shoals of *In re IBP*’s rigorous standard. It was not until 2018 that the Delaware Chancery Court sided with a regretful buyer’s claim that a MAE had indeed occurred, permitting the buyer to terminate the deal on those grounds.

While the basic structure of MAE provisions has remained essentially standardized since the 1970s, certain events have the potential to impact MAE provisions significantly and permanently. For example, early MAE provisions excluded any mention of weather-related risks; now, terrorism and natural disasters are included in almost every MAE’s list of carve-outs. The COVID-19 pandemic has the potential to be one such permanent change to the MAE formula, though recall that the LVMH-Tiffany deal did not specifically invoke pandemics as a carve-out even though it specifically mentioned other explicit types of hazard.

Figure 7 illustrates the dynamic adoption of pandemic-specific carveouts in MAE provisions. To qualify, we require that the carveout explicitly include reference to a pandemic, disease, public health crisis, or something functionally similar. Such carve-outs 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 US. With H1N1, however, the genuine possibility of pandemic related risks appeared to become more salient, and accordingly, carve-outs began to appear in an increasing number of deals. Towards 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 during 2021.

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86 *In re IBP, Inc. S'holders Litig.*, 789 A.2d 14, 16 (Del. Ch. 2001).
89 Monson, *supra*, at 773.
90 *Id.*, at 774.
The largely monotonic and increasingly steep rise of pandemic related carve-outs is suggestive of our benchmark case, in which 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, such as one might see if (for example) a regime shock suddenly enabled attorneys to “read” the situation better. This pattern, therefore, seems to have many of the markings of a learning process – where 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 carve-out, and thus only time will tell where the current trend ultimately recedes before an adoption becomes ubiquitous.

2. CFIUS Regulatory Covenants

A second branch of potential diffusion patterns concerns 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 allocate risks associated with obtaining antitrust approval from the FTC or the DOJ’s Antitrust Division.91 Companies operating in certain industries, such as banking or electrical

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91 The review of mergers for potential anticompetitive effects is undertaken by both the Federal Trade Commission and the Antitrust Division of the Department of Justice in a dual regulatory system. See, e.g., Philip J. Weiser, Reexamining the Legacy of Dual Regulation: Reforming Dual Merger Review by the DOJ and the FCC The Enduring Lessons of the Breakup of AT&T: A Twenty-Five Year Retrospective, 61 FEDERAL COMMUNICATIONS LAW JOURNAL 167–198 (2008-2009).
utilities, also require approval from the relevant regulatory agencies. 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. Standard “efforts” language appears in most deals related to regulatory risks and requirements, usually stopping short of the most extreme so-called “hell or highwater” standard, which places all of the non-closing risk on the buyer 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. The Committee on Foreign Investments in the United States (CFIUS), tasked with reviewing transactions “which could result in foreign control of any person engaged in interstate commerce in the U.S.,” has become relevant enough that “U.S. companies considering any level of foreign investment must have CFIUS on their radar.” CFIUS has the power to order itself or 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 to opposing buy- and sell-side language: sellers, seeking closing assurances, want to avoid buyers opting to walk away from a deal rather than comply with CFIUS’s mitigation measures while

93 Matthew Jennejohn, Innovation and the Institutional Design of Merger Control, 41 JOURNAL OF CORPORATION LAW 167–216 (2015–2016); (situating parties’ efforts obligations within a broader effort to allocate uncertainty between the merging parties).
94 “Hell or highwater” language was used in less than 5% of deals surveyed as it essentially corners the buyer into closing the deal no matter the cost. 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 THE M&A LAWYER 10, 3 (Nov./Dec. 2016).
95 CFIUS was brought into existence by the Exon–Florio Amendment of 1988 to Section 721 of the Defense Production Act of 1950. It was “significantly strengthened by the Foreign Investment and National Security Act of 2007 (FINSA) [which] established a statutory basis for CFIUS.” Margaret Gatti, Stephen Paul Mahinka, & Carl Valenstein, CFIUS: The Increasing Importance of National Security Reviews in M&A Transactions, MORGAN LEWIS 4 (Feb. 9, 2016), https://www.morganlewis.com/events/~/media/9d0d926af4cb442ab132176fc5a3e81c.ashx. The codified language pertaining to CFIUS can be found at 50 U.S.C. 4565.
96 50 U.S.C. app. § 2170(a).
97 MP McQueen, CFIUS Report Shows Big Jump in Investigations, 262 N.Y.L.J. 106, Sec. Expert Analysis 3 (Dec. 2, 2019) (hereinafter CFIUS Report Shows Big Jump in Investigations). 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 45-day investigation process (rather than being cleared or blocked after the 30-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 (2018), http://www.rwbaird.com/news/CFIUS-Taking-a-Larger-Role-in-Inbound-MA.
98 Sellers often negotiate for “best efforts,” “reasonable best efforts,” or “commercially reasonable efforts” language related to the buyer’s obligations seeking approval, often adding language stating
buyers, looking to preserve the option to walk away for precisely that reason, seek language eliminating liability in the event CFIUS approval cannot be obtained.99

A complicated combination of factors influences parties’ use of regulatory risk allocation language in their merger agreements. On one hand, the intensity of regulatory review has been increasing. In 2018 President Trump signed Executive Order 11858, creating the Foreign Investment Risk Review Modernization Act of 2018 (“FIRRMA”) and 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 in financial services companies which were subjected to CFIUS review rose from 26% to 46% between 2014 and 2017.100 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,101 and real estate sectors. Of note currently is the possibility that “the [COVID-19] pandemic may prompt CFIUS to examine health care sector transactions more closely than before,”102 expanding CFIUS’s real-world application in addition to its jurisdiction.103

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, “Chinese buyers complete[d] just 67% of announced outbound deals” due to regulatory concerns.104 In a further interesting twist, Chinese investors

99 Buy-side negotiators seek language confirming that “the [buyer] shall not be required to agree to any mitigation or other requirements imposed by CFIUS in connection with the CFIUS [filing].” Gatti, Mahinka & Valenstein, supra, at 37.
100 See CFIUS Report Shows Big Jump in Investigations, supra.
101 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 Transactions to Face Increased Scrutiny, 264 N.Y.L.J. 99, Sec. Outside Counsel 4, col. 4 (Nov. 20, 2020).
103 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.

104 Id. at 1, col. 2.
have been offering a “China premium” instead of agreeing to seller-friendly regulatory covenants in order to compensate for the heightened regulatory risk, meaning the investor increases their purchase price offer to compensate for the potential regulatory hurdles.\textsuperscript{105} Many sellers prefer such a premium to contractual risk allocation given that many Chinese buyers are outside the jurisdiction of necessary enforcement mechanisms and are unwilling to subject themselves to extrajudicial enforcement options.\textsuperscript{106}

Finally, after the 2014 \textit{Ralls} case, where the proponents of an 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 parties are able to more accurately assess the risk of regulatory prohibition.\textsuperscript{107}

\textbf{Figure 8. CFIUS Provisions Over Time}

\textbf{Figure 8} charts the empirical frequency of CFIUS-related provisions in the deals that we track. Although the Figure displays a very modest upwards trajectory, it does not appear to manifest the strong and nearly monotonic pattern of the

\textsuperscript{105} Given how little control either party has and thus the near non-existence of leverage in terms of responsibility for regulatory approval, Chinese buyers rarely use RTFs to alleviate CFIUS risk concerns; rather, they’re most often used “in a competitive auction setting or in connection with submitting a topping bid.” \textit{Id.}

\textsuperscript{106} \textit{Id.}

\textsuperscript{107} \textit{See Ralls Corp. v Comm. on Foreign Inv.}, 758 F.3d 296 (D.C. Cir. 2014) (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, further, requiring CFIUS and the President to disclose all non-confidential information used in making their recommendations and decisions during the review process to Ralls).
pandemic carve-outs above. Here, there appears to be significant variation year to year, 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. This in many ways makes sense, since some of the historical markers of CFIUS scrutiny, such as cross-border deals, critical infrastructure or national-security-related industries, are relatively easy to anticipate from observed deal attributes. In this case, then, the inclusion of CFIUS provisions tends to best resemble a “just right” type of diffusion, where the contract is well tailored to the situational environment.

3. Reverse Termination Fees

Reverse Termination Fees, or “RTFs,” (also known as “reverse break-up 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 Dotcom bubble, when private equity (PE) buyers began negotiating RTF provisions into deals to protect themselves in the event they were unable to obtain adequate financing.¹⁰⁸ 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 and, second, RTFs provided extra security for sellers that felt that the threat to a purchasing company’s reputation in the event they failed to obtain the necessary financing to close a transaction was simply insufficient collateral.¹⁰⁹

The increased use of RTFs followed a spike in “going private” transactions between 2005 and 2007, with language in even strategic transactions mirroring that of PE deals.¹¹⁰ By 2006, 25%¹¹¹ of all transactions—both strategic and

¹⁰⁸ Afra Afsharipour, Transforming the Allocation of Deal Risk through Reverse Termination Fees, 63 VANDERBILT L. REV. 1161–1240 (2010)
¹⁰⁹ Afra Afsharipour, Paying to Break Up: The Metamorphosis of Reverse Termination Fees, U.C. LEGAL STUD. RES. PAPER NO. 191 (Sept. 2009), available at http://dx.doi.org/10.2139/ssrn.1443613. 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, which Vice Chancellor Strine noted was an “interesting asymmetry,” as well as noting that “the factors driving it seem to include both economically rational ones and ones that are less rational.” In re Topps S’holder Litig., 926 A.2d 58, 73 n.11 (Del. Ch. 2007).
financial\textsuperscript{112}— included RTFs; in 2007 that number had risen to nearly 35\%.\textsuperscript{113} 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,\textsuperscript{114} 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 16.1\% in the 2003-04 period.\textsuperscript{115}

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.\textsuperscript{116} Second, the hybrid approach limited a buyer’s liability to payment of the RTF in the event circumstances beyond their control ultimately resulted in the termination of a deal but allowed a seller to seek specific performance in the event the buyer was responsible for circumstances leading to a transaction’s termination.\textsuperscript{117} 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.”\textsuperscript{118}

Between 2003 and mid 2009, the percentage of strategic deals which included RTFs utilizing the option-style structure rose from 8.8\% to 26.3\%.\textsuperscript{119} 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

\textsuperscript{112}“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. […] Financial buyers […] seek to acquire companies that they can grow and/or improve [with an] ultimate goal of […] selling the cleaned up company to another buyer within a few years for a substantial gain, or alternatively, to take the company public.” Afsharipour, supra, at 10-11.

\textsuperscript{113}2007 Transaction Termination Fee Study, supra note 111.

\textsuperscript{114}Afsharipour, supra note 108, at 55-56.

\textsuperscript{115}The percentage of only strategic transaction contracts which included RTFs rose from 16.9\% in the 2003-04 period to 26.1\% in the 2008-mid 2009 period. Id., at 73.

\textsuperscript{116}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.

\textsuperscript{117}In Pfizer’s $68 billion purchase of Wyeth, the $4.5 billion RTF was triggered only in the event 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.

\textsuperscript{118}Id., at 54. Additionally, in United Rentals, 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 such termination was predicated by the buyer’s own breach. United Rentals, Inc. v. Ram Holdings, Inc., 937 A.2d 810 (Del. Ch. 2007).

\textsuperscript{119}Of those 26.3\% of deals including 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 108, at 47.
buyer to walk away for any reason or gave the buyer broad latitude to arrange triggering of the payment of [a] fee”\textsuperscript{120} often representing less than 10% of a deal’s transaction value\textsuperscript{121}.

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 memorialized by agreements containing RTFs.\textsuperscript{122} However, the content of recent RTFs appears to differ from that of their predecessors. More RTFs provide for limited specific performance rights,\textsuperscript{123} employing a two-tier or hybrid structure, or are limited to instances where the buyer is unable to obtain adequate financing or regulatory (specifically antitrust) approval.\textsuperscript{124} 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\textsuperscript{125}.

\textsuperscript{120} Id., at 48.
\textsuperscript{121} Id., at 22. See also Richard A. Presutti et al., Private Equity Buyer/Public Target M&A Deal Study: 2015-17 Review and Comparative Analysis, SCHULTE ROTH & ZABEL (Sept. 17, 2018).
\textsuperscript{122} Down from 92% and 83%, respectively, in 2013-14. Id., at 15.
\textsuperscript{123} Between 2015-17, 81% of large-market transactions and 45% of middle-market transactions offered the seller limited specific performance rights. While 83% providing the seller limited specific performance rights in the 2013-14 period, 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 performance rights, increasing to 19% in the 2015-17 period. In contrast, 55% of transactions in the 2015-17 period offer the seller full specific performance rights, up from only 17% in 2013-14. See Houlihan Lokey, supra.
\textsuperscript{125} In Hexion Chemicals, the Delaware Chancery Court sought to determine whether the buyer had materially breached its representations and warranties and/or its covenants by trying to use the RTF as an option without first seeking alternate financing. Vice Chancellor 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.” Hexion Specialty Chems., Inc. v. Huntsman Corp., 965 A2d 715, 749 (Del. Ch. 2008).
Figure 9 illustrates the frequency of reverse termination fees over time. Much like CFIUS provisions, RTFs appear to have very weak discernible patterns. One interpretation is that, like with CFIUS, these terms generally “get it right” from deal to deal. That said, since around 2016, RTFs have become substantially less popular in the deals we track. To the extent this drop-off continues, it may well be more suggestive of RTFs suddenly falling out of favor—either because of a dramatic regime shift, or simple unfashionability. This pattern is one of the more difficult ones to identify with our canonical patterns simulated above.

4. “MeToo” Reps

Around the beginning of 2018, as the #MeToo movement became a household conversation topic, it also 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.”126 In response to the “major financial risk” 127 of undisclosed or post-closing sexual harassment scandals, lawyers began adding “Weinstein” or “#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

127 Id.
a March 2018 deal between SJW Group and Connecticut Water Services and, within a year, 39 publicly disclosed deals contained so-called “Weinstein clauses”. The clause can appear in a variety of incarnations, including a representation, an MAE provision, or even a closing condition, though the most common—and most effective—use 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”. Breaches of this representation offer the buyer recourse, though the extent of the remedy varies depending on whether the deal is private or public.

Most #MeToo reps follow a now familiar protocol pattern—which includes a specified lookback period or time span, limitations regarding relevant employees, related disclosure schedules, and a knowledge standard—each of which can limit or expand the scope of the following general idea: “Since x date there have been no sexual harassment allegations against the company’s executives”. The lookback period or time span is most commonly three to five years. The representations generally only cover allegations against high-level employees and are often limited in application to allegations against anyone at the rank of Senior Vice President or above. Disclosure schedules are used less frequently but can be a useful qualification tool, as they remain confidential. However, some practitioners note that “prefatory reference to a disclosure schedule might […] suggest that [a company] has significant sexual-harassment liabilities,” so target companies are wary of such a method of incorporating allegations. The knowledge standard is perhaps the most variable term: target

131 Claw backs allowing the buyer to recoup some of its investment or purchase price appears more in private company acquisitions, though the clauses have “more discursive potential in the public-deal context” given the reputational impact including or excluding such a provision might have on a company’s reputation regardless of the underlying allegations. Windemuth, supra note 129, at 498.
132 Id., at 503.
133 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 of Weinstein reps there is more pressure in certain industries, with “[t]he provision 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).
134 Burnett, supra note 130, at 2.
135 Additionally, some representations include two time periods: one (usually shorter) regarding allegations required to be reported, and one (usually longer) for complaints. Market Trends 2019: #MeToo Representations, PRACTICAL GUIDANCE – LEXIS (current as of Apr. 18, 2020).
136 Id.
137 Windemuth, supra note 129, at 508.
138 Id.
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],” while buyers often prefer a constructive knowledge requirement. Essentially, the Weinstein clause ends up operating as a guideline with respect to the level of due diligence 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 reps and their variations: first, the inclusion of these representations highlight the level of risk associated with sexual harassment as opposed to other types of litigation a company may face. Second, the reps require a target to affirm its knowledge of allegations of sexual harassment or misconduct, lowering the threshold for disclosure to one below any legally anointed claim. These two unique aspects of #MeToo reps emphasize both how hyper-aware buyers currently are of the “potentially devastating financial and social consequences of [...] sexual misconduct [...]” as well as the “relationship between corporate dealings and social norms.” While some have expressed concerns related to due process issues stemming from disclosure of unproven allegations, or the possibility that #MeToo reps encourage a target company to discourage reporting to increase the likelihood of an acquisition. However, given the depth of due diligence companies conduct into a potential target, it is equally likely that companies, especially startups, might actually reevaluate the mechanisms by which they handle such misconduct. It remains to be seen whether or not 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, also consistent with our benchmark case. For Weinstein reps, 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 (See **Figure 5** above), where the underlying economics of the

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139 Id. at 507 (citing Agreement and Plan of Merger Among Pacific Biosciences of California, Inc., Illumina, Inc. and FC OPS Corp., art. 1, § 1.01 (Nov. 1, 2018)).

140 Constructive knowledge widens the scope by including in the representations allegations which 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, at 5-6. For a discussion of actual versus constructive knowledge requirements in the context of Weinstein reps, 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, 400 (2020).

141 See id. Additionally of note is the fact that all 39 deals published within the first year of the Weinstein clause’s introduction left the word “allegation” undefined. See Windemuth, supra note 129, at 512.


143 Johnson, supra note 140, at 407.

144 Windemuth, supra note 129.
inclusion of the provision suddenly shift. This seems consistent with the arrival of the #MeToo movement at around the same time, with an increasing call for companies to renew their vigilance (or embrace it for the first time) in redressing longstanding allegations of sexual harassment and abuse among their most senior executives.

![Figure 10. #MeToo Reps Over Time](image)

As with pandemic carveouts, it is difficult to know whether the diffusion pattern of #MeToo provisions will continue to rocket upwards or will re-equilibrate to an underlying “new normal.” Either possibility presents itself here, as well as others. For example, the dramatic shift in awareness of sexual harassment issues may 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.

5. 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.\(^\text{145}\) Exercising the options allows the bidder to purchase newly issued shares

in order to 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 (DGCL § 253) to execute a “short-form, back-end” merger, forcing all remaining hold-out shareholders to relinquish their shares. 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 80–85% 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.

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—e.g., 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 Section 251 of the Delaware General Corporation Law (introducing § 251(h)), a reform that became effective on August 1, 2013. Section 251(h) introduced a somewhat more forgiving approach for two-step mergers that would allow an acquirer to freeze out the hold-out 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 in around 2005, after 2013 they collapsed, 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.


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, since it dramatically lowered the threshold with which 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 will likely invoke heightened fiduciary duties under the Revlon doctrine, and a top-up would seem especially suspect.


The final provision 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 a contractual device to reduce uncertainty in contractual relationships with parties that have connections to several jurisdictions. Many modern commercial transactions fall into this category, given that the state of incorporation, the place in which contract negotiations occur, the location of performance etc. can all fall apart and can be grounds for a court to find personal jurisdiction. In the context of M&A, choice-of-forum provisions are of particular interest, because they can

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reflect two competing interests of the parties. On one hand, most corporations are incorporated in Delaware and its courts have garnered significant expertise in presiding over corporate law disputes. At the same time, New York has long been the favored jurisdiction for business law disputes, including most commercial contract disputes. The preference is at least partially the result of a concentrated effort of 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.

It has traditionally been relatively easy for parties to access courts in New York. In assessing personal jurisdiction, courts 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 the courts’ jurisdiction. 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 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. And although these disputes were not contract disputes, courts in New York quickly embraced the narrower test to reject jurisdiction in contracts cases. 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 discuss above.

Figure 12 depicts the incidence of choice-of-forum provisions that establish the jurisdiction of New York courts. As can be seen, relatively few contracts started

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148 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).


150 “[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. (Fisch, New York Evidence § 42, at 22 [2d ed].) Such considerations are all the more compelling in the context of real property transactions, where commercial certainty is a paramount concern.” (internal quotation marks omitted) (W.W.W. Assocs., Inc. v. Giancontieri, 77 N.Y.2d 157, 162, 566 N.E.2d 639, 642 (1990));


out including a choice-of-forum provision. However, in 2010, at the advent of the change in precedent,\textsuperscript{154} 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 (Figure 5), providing preliminary evidence that drafters in the M&A context observed and quickly adjusted to their changed environment.\textsuperscript{155}

![Figure 12. Choice of Forum Over Time](image)

### IV. Implications

In the foregoing sections, 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 in practice they appear to do so with some regularity. 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 section considers the broader implications of our analysis. We highlight three such implications here: (a) adjudicating between the competing accounts of

\textsuperscript{154} The Supreme Court granted certiorari in 2010.

\textsuperscript{155} 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

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contractual evolution outlined in Part I; (b) developing a theory of bargaining in transactions where prices are fixed early on and non-price terms follow; (c) extending our framework to take on non-rational-actor decision making reasoning.

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 Goldilocksian accounts highlighted has some intuitive appeal, they are difficult to reconcile with one another 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 that best fit their idiosyncratic circumstances. 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 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 resembling a “contractual cascade,” with attorneys gravitating towards 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 provide a complete picture either. Consider the former, which posits that terms will stubbornly (and inefficiently) resist change. Such outcomes could also result in 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 pre-conditions. Most immediately, it necessitates that attorneys begin with an incorrect prior belief that the conventional term is optimal overall. Second, the negotiators must have limited information and expertise – so that their (incorrect) beliefs about the overall population will prove difficult to overcome. And finally, other limitations must 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 rapid or even moderate 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 subject to negotiation. This pattern is unusual in many ways, since the price is a key mechanism for distributing the gains provided by non-price terms. If, for example, it is more efficient for a deal to have a pandemic carve-out, its inclusion will likely impose greater risks and costs on the buyer, who is now constrained in its capacity to walk away from the deal. One way to convince the buyer to accept the efficient carve-out is to give the buyer a downward price concession, allowing it 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 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, but through informal “bartering” among non-price terms. In other words, efficient bargaining when the price is already fixed can still occur, so long as there exists a non-price term that operates somewhat like a price. For example, suppose deals increasingly came to warrant pandemic carve-outs in *force majeure* provisions, and that this trend was driven by considerations for value creation. By definition, the adoption of the carve-out 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, price-like provisions of the deal, such as the size of the buyer’s reverse termination fee. Viewed in this context, then, we might find evidence of efficient bargaining in non-price terms if RTF triggers shrink (benefitting buyers) at the same times as pandemic exclusions proliferate (imposing costs on the buyer).156

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

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156 We note that in related work, Jennejohn et al. were not able to find strong evidence of tradeoffs between RTFs and pandemic carveouts. See Jennejohn, Matthew and Nyarko, Julian and Talley, Eric L., COVID-19 as a Force Majeure in Corporate Transactions (April 1, 2020). Columbia Law and Economics Working Paper No. 625, Available at SSRN: https://ssrn.com/abstract=3577701 or http://dx.doi.org/10.2139/ssrn.3577701. In the light of our framework, this observation casts doubt on the extent to which efficient non-price ‘horse trading’ occurs in this context (at least as related to RTFs).
experiences, assuming them to be representative of the larger class. Such non-Bayesian reasoning could well induce a type of “local lock-in” effects in which certain firms tend to push a contract mutation, while other clusters tend to hold fast to the traditional term. Inquiries such as this represent an interesting and potentially fertile area to generalize and deploy our framework. Although we leave them for future endeavors, we note that a pre-condition 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 just 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 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 in the process to change law. These insights, moreover, can be directly compared to measurable empirical trends in contract practices, which we document using two decades’ worth of mergers and acquisitions contract terms. This comparison suggests that term diffusion and evolution is not a monolithic phenomenon, but instead unfolds in a variety of ways that varies considerably by context. While some trends bear the markers of efficient markets, others appear to manifest behavior more consistent of 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,” where concessions on non-price 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 has yet to be seen. But we conjecture that in many such applications, it is likely that contracting—and not love—will ultimately prevail.


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Appendix A: 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. Non-price 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 non-price 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 non-price term, counsel typically start with a default “status quo” term, and then consider whether an alteration to that status quo term – what we refer to as 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 about 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 bring to the table a set of experiences from prior deals they have negotiated, which they can collectively look to in order 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 will frequently illustrate each intermediate outcome by imposing the numerical values from our benchmark simulations in Part 2C of the text (pictured in Figure 1).

B. Deal Sequence and Population of Firms

Our model unfolds dynamically, over discrete time increments denoted by \( t \in \{1,2,3 \ldots \} \). 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
conventional 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 deal struck. For purposes of our benchmark analysis, however, we will assume that each potential transaction yields a deal with probability 1.

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 \( i = 1, 2, \ldots, N \). Each firm is associated with a (scalar) “reputational capital” value, which we denote by the indexed variable \( \theta_i \), and which we normalize to be somewhere between 0 and 1. The \( N \)-dimensional vector of reputations is denoted \( \theta \equiv \{\theta_1, \theta_2, \ldots, \theta_N\} \). 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:

\[
P = \begin{bmatrix}
0 & p_{1,2} & \cdots & p_{1,N} \\
p_{2,1} & 0 & \cdots & \cdots \\
\vdots & \vdots & \ddots & \vdots \\
p_{N,1} & p_{N,2} & \cdots & p_{N,N-1} & 0
\end{bmatrix}
\]  

(1)

Each row of the matrix corresponds to the firm representing the buyer, and each column represents the firm representing the seller. We keep the structure of \( P \) deliberately general at this stage, other than to require that all entries on the diagonal must be zero (no law firm is allowed to represent both buyers and sellers simultaneously), and its remaining components must sum to 1. Thus, for example, the component probabilities might be scaled to firm reputational capital.

In our benchmark analysis, we will assume that there are 10 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 non-diagonal element represents one permutation of distinct assignment of the firms to the buyer and seller.

\[
P = \begin{bmatrix}
0 & \frac{1}{90} & \cdots & \frac{1}{90} \\
\frac{1}{90} & 0 & \cdots & \cdots \\
\vdots & \vdots & \ddots & \vdots \\
\frac{1}{90} & \frac{1}{90} & \cdots & \frac{1}{90} & 0
\end{bmatrix}
\]  

(2)
C. Non-price 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 presumptively apply to the deal. Such “status quo” 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 in negotiating 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 $\alpha$ 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 $\alpha$.

Thus, if the buyer and seller accurately identify which type of transaction they are
facing, adopting an efficient non-price term (the conventional term or the mutation) is straightforward.\textsuperscript{158}

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 they can do is to 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 in the succeeding subsections.

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.\textsuperscript{159}

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

\textit{Prior Beliefs}

We start with the parties’ \textit{a priori} 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, of 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”

\textsuperscript{158} This approach to a mutation is obviously a simplification, since many (if not most) alterations to non-price 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 non-price 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 to represent the joint gains from the dual mutation.]

\textsuperscript{159} If the parties are risk averse, the cutoff value for $q$ might be larger than $\frac{1}{2}$. Our framework easily accommodates this possibility.
population characteristics could be skewed in either direction, so that a $\Delta\%$ fraction of the potential transactions are either T1 or T2, where $\Delta$ 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 $(1-Z)$ are 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 $\Delta$ proportion applies to T1 deals (so that the majority $(1-\Delta)\%$ of deals are of type T2) or to the 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:

\begin{align*}
Pr \{\text{Proportion of T1 deals} = \Delta\} &= r_0 \quad (3) \\
Pr \{\text{Proportion of T1 deals} = 1-\Delta\} &= 1-r_0 \quad (4)
\end{align*}

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 $r_0$. And 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 will initially assume that the conventional contract terms are there for a reason – and the parties a priori assessment is that $r_0 < 1/2$, indicating that the 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 will 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, 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 the figure, only if T1 deals are in the minority and T2 deals are in the minority (the left-hand branch) will the mutation be, on average, value enhancing. If instead 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).
Absent any additional information, then, the parties would have to rely on their overall 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 weights prior beliefs against deal-specific information is described below.

**Assessment of Instant Transaction**

In addition to their prior beliefs, the transacting parties also are 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 percent 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 make mistakes in interpreting 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 buyer’s / seller’s counsel are selected, they jointly observe a noisy signal as to whether their particular deal is T1 or T2; denote the possible signal realizations as \( t_1 \) and \( t_2 \), where \( \gamma \in (\frac{1}{2}, 1) \) embodies the signal’s precision as per the following conditional probability table:
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 $\gamma = 1/2$ the signal is wholly uninformative, and the parties cannot use it to refine their beliefs about the transaction. For intermediate values of $\gamma$ between $1/2$ and 1, the signal is not 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 percent of the time and incorrect 40 percent of the time.

Prior Experience of Transacting Law Firms

Finally, our framework presumes (like the real world) that counsel are repeat players in deal structuring, and 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 refine further 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 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 backwards a given number of periods that have transpired, considering the deals (if any) that they have 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 “$t_1$” 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 “$t_1$” 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 $t_1$ appeared $k$ times.\(^{160}\) Although the values of $Y$ and $k$ will be dependent on the random matching of firms,

\(^{160}\) 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.
we assume in our benchmark model that counsel is able to look to the beginning of the simulation.

Updated Posterior Beliefs

The three pieces of information noted above – prior beliefs ($r_0$), a noisy signal about the instant transaction ($\gamma$), and pooled information from prior transactions ($Y, k$) – allow the parties to refine and update their beliefs about the optimal term for the transaction they are negotiating. In doing so, our baseline framework assumes that the parties use “Bayes rule” to combine these pieces of information.161

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 rule, it is straightforward to confirm that the parties would have the following interim beliefs about the population-wide ratio of mutation-favoring contracts:

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

(5)

Although this interim belief does not yet incorporate anything about the signal that pertains to the instant deal (which we turn to below), 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 $\hat{r}(0,0) = r_0$. 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 the parties observed from past deals are extremely imprecise ($\gamma = \frac{1}{2}$), the expression similarly simplifies to $\hat{r}(r_0, \frac{1}{2}, Y, k) = r_0$. This also is 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 0 or 1 (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 $\gamma$:

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

(6)

Now consider how the signal observed about the actual deal in front of the parties is combined with the probabilistic assessment from equation (4) 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 rule to each type of signal, as follows. If signal τ1

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161 A definition and explanation of Bayes rule is provided in note 65, supra.
was observed, then the parties’ posterior beliefs that the current deal is T1 are given by \( \pi_1 \):

\[
\{t1, \hat{r}\} = \frac{1}{1 + \left( \frac{1 - \gamma}{\gamma} \right) \left( \hat{r} + \Delta - 2\Delta \hat{r} \right)}
\]

Conversely, if signal \( t2 \) was observed, then the parties’ posterior beliefs that the current deal is T1 are given by \( \pi_2 \):

\[
\{t2, \hat{r}\} = \frac{1}{1 + \left( \frac{1 - \gamma}{\gamma} \right) \left( \frac{\hat{r} + \Delta - 2\Delta \hat{r}}{1 + 2\Delta \hat{r} - \hat{r} - \Delta} \right)}
\]

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 \( t2 \).

\[
\{t1, \hat{r}\} = \frac{21 - 12\hat{r}}{27 - 4\hat{r}} \quad (9)
\]
\[
\{t2, \hat{r}\} = \frac{14 - 8\hat{r}}{23 + 4\hat{r}} \quad (10)
\]

**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 they might learn from the deal-specific signal they receive. In other cases, the signal is dispositive. Figure A3 illustrates this point 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 (\( \hat{r} < \rho < \frac{1}{2} \)), the parties will generally favor the standard term regardless of the signal. In contrast, when their beliefs strongly suggest that the mutation-friendly deals are very common (\( \hat{r} > \rho > \frac{1}{2} \)), then they will similarly favor the mutation regardless of the signal. When their prior beliefs are more moderate, however (\( \rho < \hat{r} < \rho \)),
the parties’ choice of term will hinge on the signal they observe (with \( t1 \) favoring the conventional term and \( t2 \) favoring the mutation).\(^{162}\)

In our benchmark model, this set of tradeoffs 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 7-8 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 they enter into.

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 \( (k; N) \) as derived above. The parties will choose the relevant non-price contract term as follows:

\(^{162}\) It is easily confirmed that \( =\gamma-1-2 \) and \( 1-\gamma-1-2 \).
• If $\hat{r} > \rho$, the mutation is chosen regardless of the signal observed.
• If $\hat{r} < \rho$, the conventional term is chosen regardless of the signal observed.
• If $\rho < \hat{r} < \rho$, the mutation is chosen if and only if the parties observe signal $t_2$,

\[ \rho = \frac{y - \Delta}{1 - 2\Delta} \quad \text{and} \quad \hat{\rho} = \frac{1}{1 - 2\Delta}. \]

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