Transformation Cost Engineering

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Abstract

Transactions in the market for corporate control are not fully standardized, but rather exhibit a material amount of variation. This paper explores a possible structural explanation: That the complexity of M&A agreements makes them susceptible to multiple sources of path dependency, which introduce tensions that unsettle incentives toward uniform standardization. Using natural language processing techniques and standard regression analysis, the article presents preliminary evidence indicating that the level of standardization of various M&A agreement provisions correlates differently with multiple sources of path dependency, lending support to the hypothesis that endogenous structural factors limit the standardization of M&A transactions. Those findings underscore the importance of including scope economies in theories of contractual innovation and enforcement, and emphasize the role of transaction designers' organizational routines as a source of market resilience.

1 Introduction

In contract economics and classical contract law, it is typically assumed that agreements are customized to the interests of the parties entering into them. Contracts are "bargained-for," to use the language of the *Restatement (Second) of Contracts*. From that perspective, the deal lawyer's role is one of precise tailoring: To advise on commercial transactions is to be a "transaction cost engineer," who carefully designs complex contractual instruments specific to the circumstances of a particular deal (Gilson 1984).

However, one of the central teachings of recent legal research on contracting is that attorneys' production costs can materially affect how contracts are designed (Scott 2019). Lawyers often standardize governance mechanisms across deals in order to reduce transaction costs (Goetz & Scott 1985), thereby achieving scale economies a la early- to mid-20th century mass production (Richman

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2012). As these boilerplate provisions are deployed repeatedly in a market, they experience network effects (Klausner 1995). That can lead to problems, such as the lock-in of inefficient terms (see Gulati & Scott 2012) or, perhaps, the ossification of contractual language to the point that the original intent of a provision becomes lost to memory—a "contractual black hole" (Choi et al. 2017).

One way to understand the dilemma of path dependency in commercial boilerplate is as an intertemporal trade-off between the familiar idea of *transaction costs* and the less-appreciated notion of *transformation costs*. Williamson famously likens transaction costs to "friction" in a physical system (Williamson 1985). In turn, devices that reduce those frictions, such as standardized contract terms, are viewed as beneficial. As Stark points out, however, those frictions within a market can have a silver lining: They can disrupt the feedback loops that lead to institutional lock-in over time (Stark 1996, 2009). Put another way, the institutions designed to reduce near-term transaction costs can raise the long-term costs of transforming those institutions.

The question then is how to balance the trade-off between transaction costs and transformation costs. The growing body of legal research studying innovation (or lack thereof) in boilerplate terms largely side-steps that question by focusing on how exogenous shocks—such as an unexpected judicial interpretation of a boilerplate term—disrupt path dependent production and spur innovation, a focus largely driven by the causal identification strategies those studies typically employ (citations). With notable exceptions (Jennejohn 2018, Gulati & Scott 2012), much less attention has been paid to endogenous aspects of innovation—how "internal" factors, such as product architecture or the routines within a law firm or the legal department of a large company, reduce transformation costs.

This Article takes a first step in combining those two perspectives. It explores a possibility evoked by Stark's counter-intuitive notion of beneficial institutional frictions: That the complexity of modern agreements can render them susceptible to multiple sources of path dependency, which introduce tensions that require the attorneys designing a particularly type of transaction to regularly interrogate the meaning of the contractual language they employ.[1] The dynamic here is similar to companies that develop multiple software platforms, each of which have their own network effects in their respective markets, and then try to deploy new technology across the separate platforms (Microsoft study). Because modern contracts are so complicated, incentives for standardization affect an agreement asymmetrically, having the paradoxical effect of sowing boilerplate's limits.

This Article analyzes a sample of M&A agreements to see whether patterns of standardization within the agreements reflect different possible sources of path dependency. M&A is studied because thousands of transactions are executed every year in the market for corporate control, and yet M&A agreements exhibit a circumscribed amount of standardization (Coates 2015; Anderson & Manns 2016). Rather than being fully standardized and subject to boilerplate lock-in's host of pathologies, they experience "constrained variation" (Coates 2015) and may be considered a form of a "mass customizable" product (Jennejohn 2018; Gilmore & Pine 1997; Durav et al. 2000).

1. To extend Choi, Gulati Scott's black hole metaphor, perhaps complex agreements are like an object subject to gravitational tides from an orbiting body of comparable mass—the unsettled character of the object is a result of the opposing force to which it is subject.

The study explores three possible sources of path dependency in the design of M&A agreements. First, it asks whether there are patterns of standardization that reflect the different overarching transactional structures available in the M&A market. U.S. corporate law allows M&A transactions to be structured in two primary ways—tender offers and negotiated transactions—the latter of which can be broken down into mergers, asset purchases, or stock purchases. Legal rules, such as Delaware's doctrine of independent legal significance, preserves those separate approaches to achieving an M&A transaction. That raises the possibility that the way a transaction is structured affects the patterns of standardization in M&A agreements. A second possibility is that standardization patterns reflect distinct bodies of legal precedent, which parties select in the governing law provisions of their M&A agreements. Finally, another possibility is that the drafting preferences of the attorneys advising on a deal will lead to standardization patterns.

Analyzing overlapping path dependencies requires expanding the frame of reference we typically use to study contract design. Much of the light shed by the existing boilerplate literature has come from qualitative and quantitative empirical research focusing upon the characteristics and evolution of discrete contract terms. Research has yet to dilate upon the behavior of broader combinations of governance mechanisms in agreements,[2] which is the critical step that this study takes.

Specifically, this study analyzes the standardization of a number of exemplary terms in a sample of 20 years of M&A agreements designed by Wilson Sonsini Goodrich & Rosati, an international law firm headquartered in San Francisco that advises many of the Bay Area's tech companies. The study employs natural language processing techniques and regression analysis to study whether those terms appear to respond differently to multiple potential sources of path dependency. The analysis unfolds in two steps.

First, the study analyzes the extent of standardization across the agreements in the hand-collected sample. This analysis shows that standardization is asymmetric across the contract terms included in the study. Provisions fall into three categories: (1) Those with a dominant common standard; (2) those with a few discrete competing standards; and (3) those that appear customized to each respective deal, rather than following a standard. In short, M&A agreements are internally diverse.

Second, the study asks whether those different patterns correlate with possible sources of path dependency. Those sources include the "structure" of the transaction—i.e., whether it is a merger, an asset purchase, or a stock purchase; (2) the legal precedent governing the transaction—i.e., Delaware, New York, California, or other states' law; and (3) the preferences of the relationship partner advising on the transaction. The results of this analysis suggest that deal structure is the most powerful source of path dependency, but it affects provisions within the agreements differently: Some provisions cluster around common standards according to the transaction's structure, but others are unaffected. Interestingly, evidence of attorney preferences affecting the level of standardization exists but is surprisingly weak—only three partners in the sam-

2. Macher & Richman (2008) note in an interdisciplinary review of empirical contract scholarship that interaction effects between contract provisions are rarely studied. Jennejohn (2018) and Hwang & Jennejohn (2019) are early efforts to think systematically about interactions among provisions within complex agreements.

ple correlate significantly with certain standardization patterns. Finally, parties' choice of law also has surprisingly little statistically significant correlation with the extent of standardization for any of the provisions studied.

One way to understand the patterns observed is that deal attorneys engage in a form of "multihoming" to different contractual standards, in that they design agreements to be compatible with multiple standards.[3] Meaning is retained as Stark argues—multihoming to diverse standards requires transaction cost engineers to regularly revisit the purposes underlying the provisions they are recombining from deal to deal.[4]

Asymmetric standardization calls for taking scope economies seriously in our models of contractual innovation. Whereas existing scholarship emphasizes scale economies and an assembly line-like organization of production, asymmetric standardization emphasizes transaction designers' ability to recombine different technological platforms across a high volume of deals. A foundation for including scope economies in our models of contractual innovation can be found in a well-established line of strategy research on "ambidextrous" organizations, which are capable of pursuing both scale and scope economies simultaneously (March 1991; Tushman & O'Reilly 1997; O'Reilly & Tushman 2008).

The paper proceeds as follows. First, I briefly discuss current research on contractual standardization and its inability to explain the mass customization of M&A agreements. Second, I present the results of the empirical analysis, which supplies tentative evidence that the standardization of certain agreement terms correlates differently with various potential sources of path dependency, suggesting that standardization is asymmetric. Finally, I discuss the possibility that corporate law firms involved in the design of M&A agreement are examples of "ambidextrous" organizations, and outline next steps for future research in that regard.

2 The Design of Complex Contractual Systems

2.1 Designing Customized and Standardized Governance Mechanisms

Conventional contract economics is rooted in the insight that markets do not operate as smoothly as general equilibrium models theorize (Spulber 1999). The uncertain decisionmaking environments of modern markets often limit humans' ability to foresee future events, which makes determining and enforcing performance obligations difficult (Simon 1972). As Coase pointed out, transactions are costly, and the neoclassical assumption that markets naturally clear does not necessarily hold (Coase 1937). This has led to two great literatures, one on the theory of the firm, which understands the modern company as a solution to contractual incompleteness (Williamson 1974, 1985; Hart 1995), and one on contract design, which explores how parties can use contractual governance

3. Multihoming to different technical standards is the topic of an extensive literature in information technology and is a growing subject of study in economics (see, e.g., Economides 2007).

4. For readers familiar with the modularity literature (see Baldwin & Clark 2000), multihoming requires deal lawyers to regularly engage in architectural rather than infra-modular innovation.

mechanisms to mitigate the effects of incompleteness to the extent that market exchange is efficient (Brousseu & Glachant 2012).

Most research on contract design makes two fundamental simplifying assumptions, which are useful for rendering contracting problems more tractable for systematic study. First, it is commonly assumed that agreements are fully customized, and therefore the terms of a contract are direct reflections of the parties' preferences, capacity to foresee future contingencies, risk tolerances, and bargaining positions (Choi et al. 2017). The potential for path dependencies is afforded little place in the standard families of models. Second, most research abstracts away from complexity, so that governance mechanisms are often studied in isolation. In a certain sense, complexity plays an important role in contract economics, but it is largely limited to *environmental* complexity—*i.e.*, the extent to which complicated decision landscapes prevent parties from specifying obligations *ex ante* (Segal 1999; Che & Hausch 1999). Interactions between collections of terms in complex agreements are often overlooked (Macher & Richman 2008).

Recent legal scholarship has added an important dimension to the contract design literature by relaxing that first assumption. Beginning with pioneering work by Goetz & Scott (1985), Klausner (1995), and Kahan & Klausner (1997), a rich literature has grown exploring the standardization of governance mechanisms across transactions. This work emphasizes that attorneys' pursuit of scale economies can affect the choice of governance mechanisms, separate from bargaining dynamics. As markets grow thicker and the costs of negotiating and drafting contracts increase, transaction designers may economize on production costs by reusing contract language from one deal to the next. At least, that strategy is available to address low-uncertainty exchange hazards (Gilson et al. 2012), which recur frequently enough for attorneys to gravitate towards a standardized governance response. Producing contractual governance mechanisms at scale has its obvious benefits: use of a widely accepted standard allows parties to reduce *ex ante* negotiating costs and *ex post* enforcement costs, and it may serve as a signaling mechanism within the market (Kahan & Klausner 1997). But it also comes with an important cost: the increasing returns to scale that contractual standards enjoy can lead to lock-in, as parties' costs of switching from the standard rise, which in turn may result in parties using provisions that are in fact inefficient with respect to the details of their particular deal (Gulati & Scott 2012). In that respect, the boilerplate literature problematizes contractual innovation, whereas conventional contract economics assumes innovation is readily achievable.

Just why parties' switching costs may increase as contractual language becomes more standardized has been a matter of debate. A number of explanations focus, as one would expect, on the incentives transaction designers face. From this perspective, lock-in is rational because boilerplate terms may reduce learning costs for transaction designers, who can come to rely on contractual language that is worked pure through the standardization process, or, relatedly, because switching from standardized terms may be costly if other market actors will not be able to accurately price a formulation that deviates from the standard (Gulati & Scott 2012). Another group of studies points to agency cost explanations: that standardization is the result of inefficient organizational routines at large law firms, attorneys free-riding on others' work, or rent-seeking by lawyers insulated from rigorous competition (Gulati & Scott 2012; Anderson

& Manns 2016; Hadfield 2017).

Court interpretation of contract terms can also contribute to their standardization. Courts can provide definitive interpretations, which confirm the market's understanding of a standardized contract term (Gulati & Scott 2012). In a broad study of a variety of transaction types, including M&A agreements, Eisenberg & Miller (2006) find evidence that contract terms standardize around legal precedent in certain circumstances. Conversely, if a court interpretation of a term conflicts with the market's conventional wisdom, then an "overhang" may result, where the contracts in parties' portfolios now have provisions that mean something different than what parties originally thought (Gulati & Scott 2012). Where courts' interpretations conflict with market understandings, available evidence suggests that court intervention can spur the recalibration of a contractual standard (Choi et al. 2017).

2.2 The Puzzle of Mass Customization and the Problem of Systemic Complexity

Current theory struggles to explain the mass customization of M&A agreements. Given the maturity and thickness of the market for corporate control, which in the United States has experienced thousands of transactions each year for decades, one would expect a significant amount of contractual standardization as deal lawyers converge on best practices. Yet, M&A agreements occupy a hybrid ground of "constrained variation" (Coates 2015), which some have taken for grounds that greater efficiencies can be achieved through further standardization of M&A contracts (Anderson & Manns 2016).

Existing theory struggles to explain the material amount of customization observed in M&A agreements because it overlooks infra-transactional complexity (Jennejohn 2018). Contractual complexity raises the possibility of endogenous sources of variation in contract design: first, that terms may be interdependent, so that a change in one term affects another; and, second, that expanding an agreement's design space increases the likelihood that more than one of the multiple theories of how standardized terms become locked-in introduced above affects a portion of the contract. Few studies analyze either how provisions interact or how different incentives to standardize may intersect with one another as they shape parts of an agreement. Presumably, multiple incentives to standardize may reinforce one another, raising impediments to contract innovation even further; but it seems equally possible that incentives to standardize may not work in tandem. This paper takes a step toward filling that gap in the literature.

3 Asymmetric Standardization in M&A Agreement Design

This section presents the results of an empirical study that takes a step towards addressing the complexity gap in the literature discussed above. The study attempts to accommodate greater complexity with respect to both the sources of path dependency affecting a transaction and the collections of governance mechanisms combined in modern contracts. It does so by focusing upon three potential sources of path dependency and examining whether there is evidence of any of them correlating with the level of standardization of a variety of exemplary terms in M&A agreements. To measure the standardization of contract provisions, the study follows Rauterberg & Talley (2017a, 2017b) by leveraging vector-space natural language processing techniques, although the unsupervised approach here differs from their supervised method with respect to the specific research question being addressed and in certain additional technical aspects. The study then specifies an ordinary least squares model to analyze correlations between the level of standardization of various terms and the potential sources of path dependency.

3.1 Research Design and Hypotheses

The study's overarching research question asks whether (1) different incentives to standardize contractual language have (2) differing effects on the design of various provisions in M&A agreements. Given the abundance of theories of why provisions become locked-in, and given the large number of terms found in a modern M&A agreement, some choices must be made on how to narrow that question sufficiently to make it tractable and yet not obscure the very complexity it is meant to study. This study therefore focuses on three factors shaping the standardization of contract terms: deal structure, legal precedent, and attorney preference. Controls for deal value and time variance are also included. The study then examines correlations between those three factors and seven types of provisions frequently found in M&A agreements.

Specifically, the following hypotheses are tested:

H1 - Contract provisions are less standardized *across* agreements, but are more standardized *within* deal types (*i.e.*, a merger, an asset deal, or a stock purchase).

H2- Contract provisions are more standardized by the choice of governing law.

H3- Contract provisions are more standardized by the relationship partner advising on the deal.

3.2 Data and Variables

The sample of M&A agreements analyzed here were all negotiated by Wilson Sonsini, as buyer's counsel, from 1996 to 2016. The sample includes agreements of three types: asset purchase agreements, merger agreements, and stock purchase agreements. All agreements are public documents filed with the SEC and can be found on the SEC's EDGAR portal.[5]

Two broad categories of data were collected with respect to that sample. First, 10 key provisions were extracted from the sampled agreements in order to study the extent of their standardization. Those provisions serve as the dependent variables in this study. Second, certain characteristics of the agreements

5. The agreements sampled here were identified using Bloomberg Law's EDGAR search functionality.

and the parties to them—such as the deal type, each contract's choice of law, the attorneys advising on the transaction, the date, and the deal value—were hand collected. These characteristics comprise the explanatory and control variables of the study.

3.2.1 Delineating the Dependent Variables

Selecting Provisions to Study

Testing the hypotheses above requires the collection of a range of provisions from each sampled agreement. The following terms were selected for study: the target company's representations with respect to its corporate authority, current litigation, employee matters, intellectual property, and taxes; interim operating covenants; "No-shop" provisions; indemnification provisions; severability provisions; and the definition of "material adverse effect." Those provisions were selected because they frequently appear in the sampled agreements. A background issue affecting the research design of any study undertaking a textual analysis of M&A agreements is that the incidence of terms found in the contracts is not consistent across agreements. Some provision types are routinely included, while others are not. This study focuses upon those provisions that tend to be included more frequently, which may bias the sample towards finding more evidence of standardization because routine use is typically a necessary (though not sufficient) condition to standardization. An important task for subsequent research is to collect samples of sufficient size to allow analysis of less commonly used provisions.

Measuring the Extent of Standardization

Testing the hypotheses set forth above requires a method for comparing the extracted provisions to one another in order to measure the extent of standardization. Of course, deal lawyers do this all the time when they run a blackline, which identifies how different Provision A_1 in Agreement X_1 is from Provision A_2 in Agreement X_2. Comparing text at scale introduces some technical complications, however. Approaches for comparing large samples of text strings fall roughly into two categories—character-based string similarity functions and vector-space string similarity functions (Bilenko & Mooney 2003)—discussed below. For the reasons that follow, this study employs a vector-space approach.

Character-based similarity functions, such as those used by Anderson & Manns (2017), view strings of text as contiguous sequences differing at the level of individual characters (Bilenko & Mooney 2003). Perhaps the most well-known character-based method for testing the similarity of different text strings is edit, or Levenshtein, distance, which calculates the difference between two strings as the minimum number of character changes, insertions, or deletions that would be required to render one string identical to another (Levenshtein 1966). So, for example, the edit distance between the string, "the cat is black," and the string, "the hat is black," is 1, because changing one character—the "c" in "cat" to an "h"—transforms the first string into the second. Edit distance typically relies upon word sequencing remaining stable between strings, and is therefore often applied to identify typographical errors or abbreviations in strings of text (Bilenko & Mooney 2003). Edit distance also becomes computationally expensive and tends to be inaccurate as the size of text strings increases (Bilenko & Mooney 2003).

A vector-space approach differs in that it does not view strings as ordered sequences of words, but rather as unordered collections of "tokens"—or "bags of words" in the vernacular of the field (Salton & McGill 1983).[6] In a corpus with n tokens, each string is then represented as a vector of real numbers with n-dimensions, where every non-zero component indicates a token present in the given string (Bilenko & Mooney 2003). Tokens represented in the vector are commonly weighted according to their uniqueness by deleting a list of common "stop-words" and/or applying a "term frequency-inverse document frequency" measure (Salton & Buckley 1988). The upshot of transforming written text strings into numerical vectors is that similarity between strings can be measured by reference to the comparative positions of the vectors, using measures such as cosine or Euclidean distance, which has proven to be a robust approach for analyzing similarity in a wide range of corpora (Bilenko & Mooney 2003).

A vector-space approach to analyzing the differences between provisions in merger agreements appears to be the most appropriate for two reasons. First, it is not uncommon for words and phrases in different instances of the same provision type to be arranged in unique orders. To the human reader, it is readily apparent that, although the words are ordered somewhat differently, the provisions are quite similar. A character-based similarity measure such as edit distance, however, may incorrectly compare such strings, if the different word sequences are read as qualitative differences. Second, comparing merger agreements requires a method that can effectively analyze both relatively short strings—such as a severability provision—and fairly long strings—such as an earnout with multiple sub-sections. A string similarity function focused upon individual characters may struggle to accurately assess the latter type of provision.

Pursuing a vector-space approach here involved the following process:

1. Individual text files for the provision types of interest were hand-collected from the sampled agreements and separated into respective corpora.[7];

2. Each corpus file was then cleaned by:

    (a) Removing punctuation,

    (b) Removing numbers and dates, and

    (c) Eliminating resulting excess spaces in the text resulting from those first two steps;

3. Each corpus was converted tokens, the corpus was organized into a matrix, and then tokens were weighted for novelty through a term frequency-inverse document frequency transformation (Rauterberg & Talley 2017b);

6. For an excellent example of a vector-space approach applied in the legal context, see Rauterberg & Talley's analysis of corporate opportunity waivers (2017a, 2017b). The unsupervised approach pursued here is conceptually similar, though different in some technical details, to Rauterberg & Talley's supervised method.

7. Hand collection involved a two-step process, in which (1) two teams of research assistants extracted the same targeted data, and their results were compared for inconsistencies, and (2) those results were then subjected to an independent quality control process, where initial coding decisions were compared to the source materials

4. To reduce the dimensionality of those high-dimensional vector spaces, the principal components of each corpus were calculated; and

5. The extent of standardization within each corpus was estimated by calculating the cosine similarity for the documents in each corpus and by analyzing clustering using a k-means/k-mediods approach.

3.2.2 Explanatory and Control Variables

Data with respect to the three explanatory variables were also hand-collected from the publicly-available agreements. Provision types were coded as to whether they addressed discrete exchange hazards or broader aggregations of hazards. Deal type was coded for each contract by reference to the agreements' titles and recitals. The choice of law selection in each agreement was also hand collected. The attorneys advising on the transaction were hand-collected from Bloomberg and verified against each merger agreement's notice provisions. The date of the agreement's execution and the deal value was also hand-collected from the agreements and Bloomberg. All hand-collection was conducted under the same quality assurance protocol introduced above.

3.3 Methods

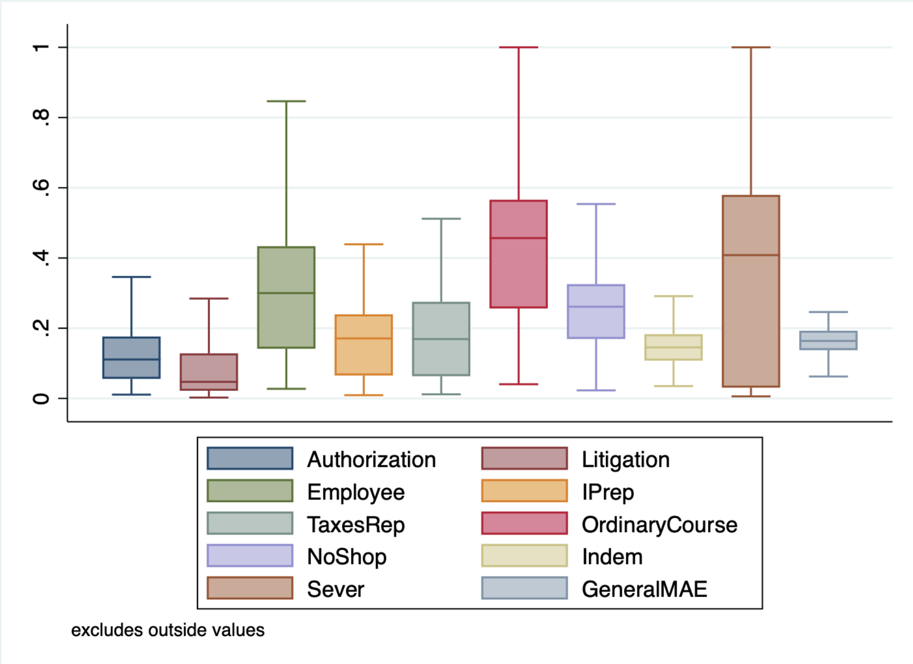
Because the dependent variables are continuous, this study specifies an ordinary least squares model to analyze the correlations between the provisions of interest and a number of potential determinants of standardization. As an observational study, the analysis here cannot identify causality. However, statistically significant correlations identified through this approach can frame our debate over what is driving contractual standardization, and they can set the stage for subsequent studies with more precise identification strategies.

3.4 Results

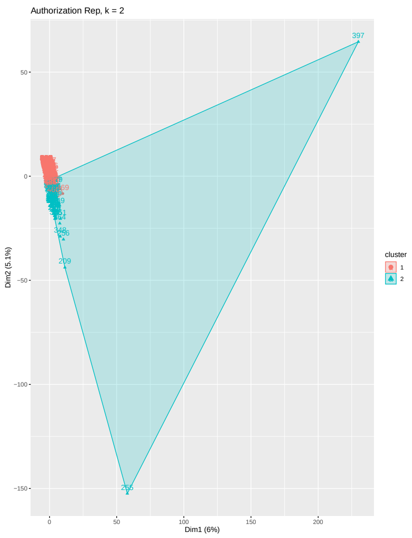
3.4.1 Standardization Patterns in the Sampled Agreements

Analysis of the provisions extracted from the sampled agreements illustrates that standardization is asymmetric across contract terms. Consider, for instance, the results of the cosine similarity analysis. Figure 1 below depicts box plots for all extracted provision types, the average cosine similarity of the documents in each provision type plotted along the Y-axis on a scale of 0 (less similar) to 1 (more similar). Employee representations, conduct of business covenants, and severability provisions appear highly standardized across all agreements. All other provisions appear less standardized.

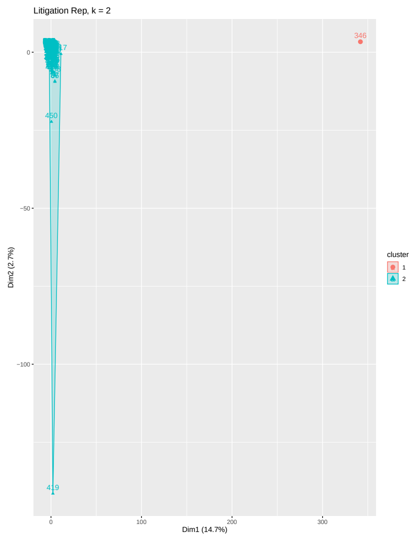
Figure 1: Standardization of Representative Provisions



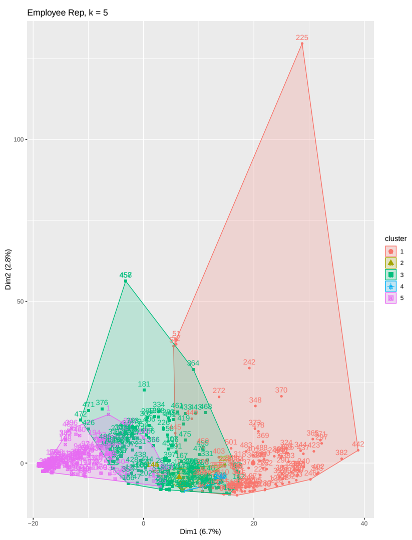
As mentioned before, the cosine similarity analysis cannot tell us much about the middle ground between complete standardization and total customization—*i.e.*, there two or more standards compete with one another. To achieve that level of visibility, k-means/mediods clustering is analysed, and the results are depicted graphically below. For some provision types, the documents are very similar to one another so that a single cluster is tight, and the emergence of discrete different clusters is minimal. See, for instance, the results for Authorization reps, Litigation reps, and severability provisions. For other provisions, documents are more dispersed, but identifying discrete clusters is difficult. See, for example, Employee reps, IP reps, and No-Shop provisions. And finally, for some provisions, relatively discrete clusters are identifiable. That includes, interim operating (or "ordinary course") covenants, indemnification provisions, and material adverse change definitions.



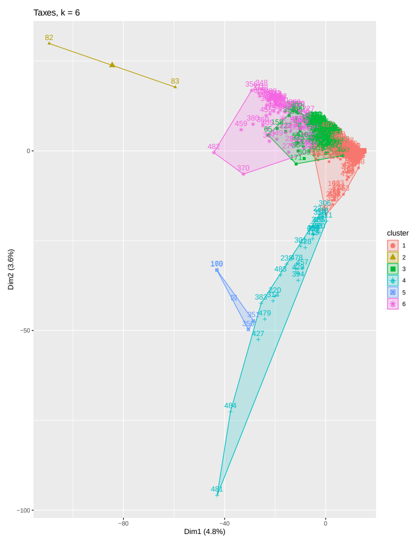
(a) Clustering Among Authorization Reps



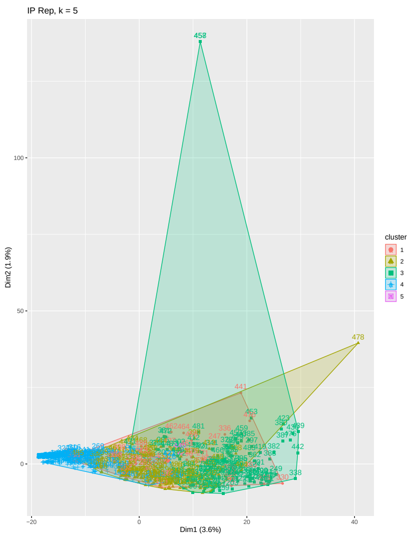
(b) Clustering Among Litigation Reps



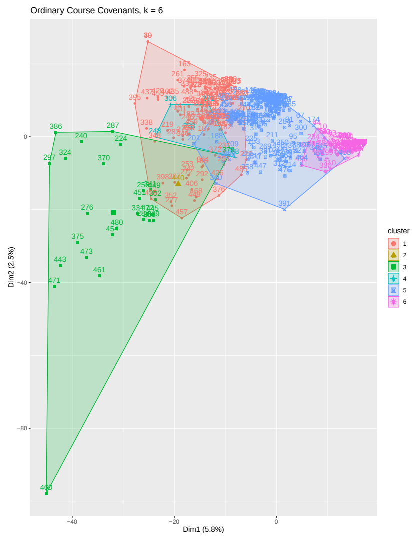
(c) Clustering Among Employees Reps



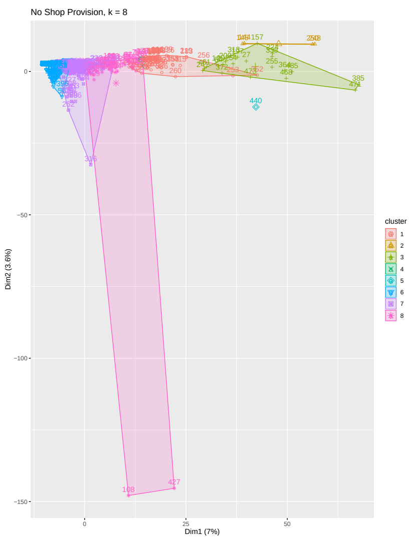
(d) Clustering Among Taxes Reps



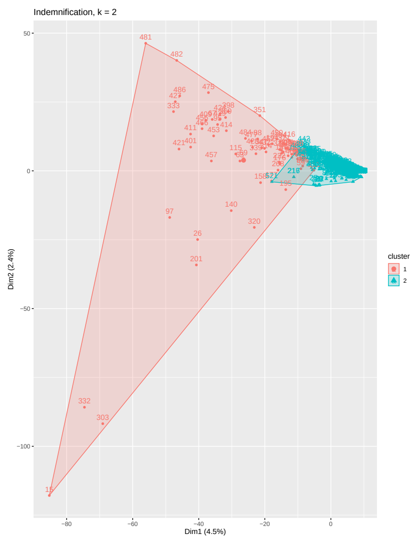
(e) Clustering Among IP Reps



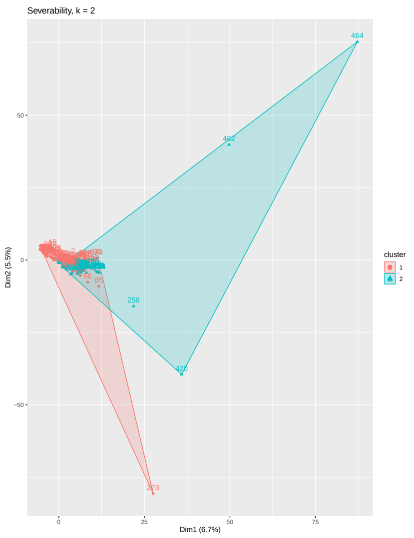
(f) Clustering Among Ordinary Course Covenants



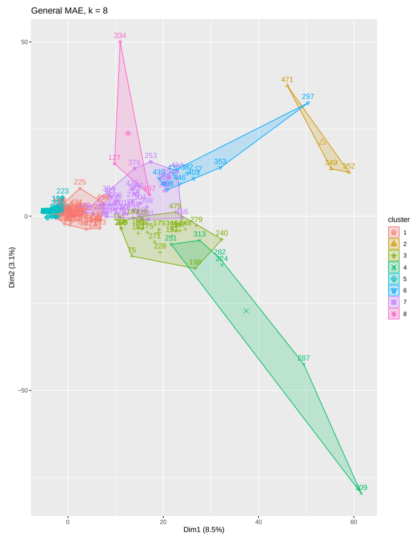
(g) Clustering Among No Shop Provisions



(h) Clustering Among Indemnification Provisions



(i) Clustering Among Severability Provisions



(j) Clustering Among Material Adverse Effects Definitions

Both the results of the cosine similarity and the k-means/k-mediods analysis suggest that standardization is asymmetric across provision types. Some provisions are highly standardized, others appear to have multiple standards, and others appear to be more customized.

3.4.2 Predicting Standardization Patterns Across the Agreements

The results of the regression analyses suggest that the standardization patterns observed above correlate with different institutions in which the deals are situated. Standardization patterns for some terms correlate significantly with different deal structures. Others correlate significantly with governing law. Finally, some correlate significantly with the particular partners advising on the transaction. It is also worth noting that, of the controls, deal value nearly never has a significant correlation with the extent of standardization and, on the other hand, that the passage of time almost always correlates positively and significantly with greater standardization, although magnitude of the effect is very small.

Given the large number of tables, the complete results of the regression estimates are provided in the Appendix below. For ease of interpretation, the following summary tables are provided. The tables report results of an OLS estimation of the correlations between cosine similarities of the provisions serving as the left-hand side variable and the right-hand side variables (deal type, choice of law, attorney preferences, deal value, and date) and a multinomial logistic estimation of the correlations between the clusters identified using the k-mediods clustering method and the right-hand side variables. A "Y" in the table indicates that there is a statistically significant relationship ($p<0.05$).

Table 1: Summary of Results of Regression Analyses of M&A Provision Design

	(1)		(2)		(3)		(4)		(5)	
	Aut.		Lit.		Emp.		IP.		Tax.	
	Cos.	k	Cos.	k	Cos.	k	Cos.	k	Cos.	k
Deal Type: APA			Y		Y		Y	Y		Y
Deal Type: SPA										
Delaware								Y		
New York								Y		
California										
Attorney Effect	Y		Y				Y			
Deal Value							Y			
Date	Y		Y		Y		Y	Y	Y	Y

Table 2: Summary of Results of Regression Analyses of M&A Provision Design

	(1)		(2)		(3)		(4)		(5)	
	Ord.		NoSh.		Ind.		Sev.		MAE	
	Cos.	k	Cos.	k	Cos.	k	Cos.	k	Cos.	k
Deal Type: APA					Y					
Deal Type: SPA										
Delaware										
New York										
California										
Attorney Effect							Y			
Deal Value										
Date	Y		Y		Y	Y	Y		Y	Y

4 Ambidextrous Contract Design

The analysis above outlines a preliminary case that complex contracts, such as as the M&A agreements studied here, experience asymmetric standardization. Contract terms are not wholly unconnected but also not designed in lock-step; rather, they are subject to different incentives to standardize of varying intensity.

Distinct patterns of continuity and change are observable in the agreements—some terms appear to gravitate towards one standard, and other terms towards another. In a sense, transaction designers are "multi-homing" to more than one standard, in that their product—the M&A agreement—is compatible with a number of different standards (Choi 2010). Path dependencies work subtly on the design of these complex contracts, and their persistent presence arguably creates the tension that prevents the meaning of M&A agreement terms from ossifying.

This account of contract design, which emphasizes the importance of scope economies, elevates the role of the deal attorney and, to the extent the boilerplate literature has questioned the value added by transactional lawyering, perhaps returns her to the prominence implied in Gilson's original conception of the "transaction cost engineer" (Gilson 1984). In doing so, however, it raises the follow-on question of how corporate lawyers are able to recombine contractual governance systems across deals with such alacrity. That is, the combination of economies of both scale and scope in the design of M&A transactions places law firms' internal organizational structures and routines at the center of our understanding of contract innovation.

Strategy theorists have developed the concept of "organizational ambidexterity" (Duncan 1976) in an effort to solve the riddle of how some mature companies are able to recombine assets in ways that sustain competitive advantage over time (O'Reilly & Tushman 2008). That reinvention is puzzling because the capacities for effective *exploitation* of assets—*i.e.* resolving uncertainties, reducing variances, and increasing productivity—are different from those necessary for *exploration*, which requires capabilities of search, exploring ambiguities, and embracing variation (March 1991). Ambidexterity refers to those organizations that can deploy both suites of capabilities, perhaps even simultaneously (O'Reilly & Tushman 2008; Tushman & O'Reilly 1997).

Interestingly, organizational ambidexterity in corporate law firms does not appear to be achieved as conventional wisdom would predict. Strategy research has found that senior management teams, who can appropriately direct resources toward exploitative and explorative efforts, are the key to effective organizational ambidexterity (O'Reilly & Tushman 2008). Transaction design is intriguing in this respect because it is a highly collaborative effort that is often undertaken without the managerial hierarchy employed in a traditional company. The design of an M&A agreement typically involves collaboration between at least two organizations—the client's in-house legal team and external counsel. Particularly in cross-border deals, it is not uncommon for multiple law firms to act as external counsel, increasing the number of organizations collaborating on the transaction. The partnership structure within major law firms, particularly those that follow (more or less) lock-step compensation that encourages task force staffing on matters, also encourages the recombination of teams over time (Jennejohn 2018), which undercuts a hierarchical management approach. A project for future research is unpacking deal team routines in order to identify how ambidexterity is achieved in the legal industry without strong hierarchy.

5 Conclusion

This paper addresses the question of why transactions in some thick markets are not completely standardized and, as such, do not slip into a contractual "black hole." In the context of M&A transactions, it explores the possibility of a structural explanation: that the complexity of M&A agreements creates space for multiple sources of path dependency to shape parts of the contract asymmetrically, and this criss-crossing of path dependencies undercuts incentives to completely standardize the contracts. Using novel natural language processing techniques and regression analysis, it finds suggestive evidence that exemplary portions of M&A agreements correlate differently with three sources of path dependency. Standardization in M&A agreements does indeed appear asymmetric. That finding's primary theoretical implication is to underscore the need for including economies of scope, not only economies of scale, in theories of contractual innovation. The importance of scope economies also brings organizational routines to the fore, and this article calls for further investigation of how corporate law firms effectively combine economies of scope and scale in the design of complex transactions.

A Appendix

Table 3: Results of OLS Regression Analysis of M&A Provision Design

	(1) Authorization	(2) Litigation	(3) Employee
Deal Type: APA	0.0397	0.0614**	0.0848**
	(1.65)	(2.63)	(2.85)
Deal Type: SPA	-0.0181	-0.00930	-0.0108
	(-0.72)	(-0.39)	(-0.34)
Delaware Law	-0.0545	-0.0187	0.00150
	(-1.61)	(-0.55)	(0.03)
New York Law	-0.0469	-0.0360	0.00458
	(-1.10)	(-0.85)	(0.09)
California Law	-0.0547	-0.0171	-0.0290
	(-1.55)	(-0.49)	(-0.64)
Deal Value	1.40e-11	2.60e-12	-3.72e-12
	(1.37)	(0.53)	(-0.62)
Date	0.00000801*	0.0000244***	0.0000126*
	(2.03)	(6.11)	(2.48)
Constant	0.0564	-0.294***	0.0980
	(0.77)	(-3.95)	(1.02)
Observations	313	318	295
Pseudo R^2			

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4: Results of OLS Regression Analysis of M&A Provision Design

	(1) IP Rep	(2) Taxes Rep	(3) Ordinary Course
Deal Type: APA	0.0765***	0.0394	0.0593
	(3.50)	(1.75)	(1.73)
Deal Type: SPA	-0.00961	-0.00236	-0.00582
	(-0.42)	(-0.10)	(-0.16)
Delaware Law	0.00472	0.00181	-0.00441
	(0.15)	(0.05)	(-0.10)
New York Law	-0.00913	0.0124	-0.00136
	(-0.23)	(0.29)	(-0.02)
California Law	-0.00596	0.0179	-0.0141
	(-0.18)	(0.50)	(-0.29)
Deal Value	1.45e-12	1.31e-12	-1.06e-11
	(0.31)	(0.28)	(-0.73)
Date	0.0000162***	0.0000245***	0.0000127*
	(4.30)	(6.39)	(2.19)
Constant	-0.0970	-0.225**	0.226*
	(-1.38)	(-3.07)	(2.11)
Observations	316	317	265
Pseudo R^2			

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5: Results of OLS Regression Analysis of M&A Provision Design

	(1) No Shop	(2) Indem	(3) Severability	(4) MAE Def
Deal Type: APA	0.0257	0.0533**	0.0545	0.0495
	(0.83)	(2.69)	(1.28)	(1.20)
Deal Type: SPA	-0.00589	-0.0265	-0.0375	-0.00431
	(-0.17)	(-1.21)	(-0.83)	(-0.10)
Delaware Law	-0.0338	0.00452	-0.0962	0.0150
	(-0.77)	(0.16)	(-1.59)	(0.30)
New York Law	-0.105	-0.0291	-0.0821	-0.0394
	(-1.86)	(-0.80)	(-1.08)	(-0.66)
California Law	-0.00692	0.00780	-0.0901	0.0409
	(-0.15)	(0.27)	(-1.43)	(0.78)
Deal Value	-1.56e-12	7.96e-12*	-1.55e-12	2.80e-12
	(-0.11)	(2.01)	(-0.17)	(0.54)
Date	0.0000378***	0.00000699*	0.0000362***	0.0000299***
	(6.82)	(2.02)	(5.08)	(4.31)
Constant	-0.316**	0.0325	-0.182	-0.340**
	(-3.05)	(0.51)	(-1.37)	(-2.75)
Observations	255	278	324	113
Pseudo R^2				

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6: Results of OLS Regression Analysis of M&A Provision Design

	(1) Authorization	(2) Litigation	(3) Employee
Deal Type	Y	Y	Y
Choice of Law	Y	Y	Y
Deal Value	Y	Y	Y
Date	Y	Y	Y
Partner 1	-0.000484	0.00604	-0.0357
	(-0.01)	(0.11)	(-0.46)
Partner 2	-0.0967*	-0.119*	-0.116
	(-2.01)	(-2.36)	(-1.74)
Partner 3	0.0835	0.0962	0.0253
	(1.53)	(1.90)	(0.40)
Partner 4	0.0606	0.0645	0.0393
	(1.27)	(1.36)	(0.63)
Partner 5	0.0801	0.0740	0.0325
	(1.39)	(1.18)	(0.46)
Partner 6	-0.00464	-0.0448	-0.0187
	(-0.10)	(-0.95)	(-0.32)
Partner 7	-0.0320	-0.0186	-0.0285
	(-0.93)	(-0.56)	(-0.68)
Partner 8	0.00568	-0.0137	-0.0593
	(0.13)	(-0.32)	(-1.06)
Partner 9	0.110	0.0544	0.0821
	(0.79)	(0.56)	(0.68)
Partner 10	-0.0115	-0.0388	0.00336
	(-0.27)	(-0.90)	(0.06)
Partnre 11	-0.0344	-0.0375	0.0136
	(-0.84)	(-0.91)	(0.26)
Partner 12	0.0709	0.103	0.0230
	(1.22)	(1.79)	(0.26)
Partner 13	0.0102	0.00319	-0.0750
	(0.25)	(0.08)	(-1.48)
Partner 14	0.0853	-0.0225	-0.0702
	(1.35)	(-0.36)	(-0.89)
Constant	0.0321	-0.307***	0.0898
	(0.41)	(-3.94)	(0.88)
Observations	313	318	295
Pseudo R^2			

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 7: Results of OLS Regression Analysis of M&A Provision Design

	(1) IP Rep	(2) Taxes Rep	(3) Ordinary Course
Deal Type	Y	Y	Y
Choice of Law	Y	Y	Y
Deal Value	Y	Y	Y
Date	Y	Y	Y
Partner 1	-0.0594	-0.0417	0.0117
	(-1.09)	(-0.75)	(0.14)
Partner 2	-0.0501	-0.0906	-0.0873
	(-1.01)	(-1.74)	(-1.19)
Partner 3	0.124*	0.0497	0.0407
	(2.58)	(1.07)	(0.55)
Partner 4	0.0496	0.0460	0.0416
	(1.11)	(1.05)	(0.61)
Partner 5	0.0227	-0.00780	0.00894
	(0.42)	(-0.14)	(0.11)
Partner 6	-0.0259	-0.0630	-0.107
	(-0.58)	(-1.38)	(-1.58)
Partner 7	-0.00830	-0.0154	-0.0306
	(-0.27)	(-0.48)	(-0.64)
Partner 8	0.0243	0.0249	0.0952
	(0.60)	(0.59)	(1.40)
Partner 9	0.0437	0.108	0.124
	(0.47)	(1.13)	(0.94)
Partner 10	-0.00637	0.0409	0.0139
	(-0.16)	(0.98)	(0.23)
Partner 11	0.0227	-0.0116	0.0768
	(0.57)	(-0.27)	(1.18)
Partner 12	0.0261	0.0421	0.196*
	(0.44)	(0.75)	(2.06)
Partner 13	-0.0337	-0.0375	-0.0469
	(-0.84)	(-0.95)	(-0.77)
Partner 14	-0.0139	-0.0341	-0.0942
	(-0.21)	(-0.61)	(-0.86)
Constant	-0.0857	-0.238**	0.258*
	(-1.16)	(-3.06)	(2.29)
Observations	316	317	265
Pseudo R^2			

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 8: Results of OLS Regression Analysis of M&A Provision Design

	(1) No Shop	(2) Indem.	(3) Severability	(4) MAE Def
Deal Type	Y	Y	Y	Y
Choice of Law	Y	Y	Y	Y
Deal Value	Y	Y	Y	Y
Date	Y	Y	Y	Y
Partner 1	-0.00654	0.0427	-0.0837	-0.106
	(-0.08)	(0.99)	(-0.97)	(-1.03)
Partner 2	-0.116	-0.0755	-0.281**	-0.106
	(-1.60)	(-1.36)	(-3.24)	(-1.76)
Partner 3	0.0420	0.0850	0.0999	0.0585
	(0.66)	(1.83)	(1.09)	(0.89)
Partner 4	0.0140	0.0640	0.0482	0.0337
	(0.21)	(1.67)	(0.59)	(0.40)
Partner 5	-0.00261	-0.00631	-0.208	
	(-0.04)	(-0.11)	(-1.83)	
Partner 6	0.000238	0.0198	-0.0170	-0.0690
	(0.00)	(0.47)	(-0.20)	(-0.96)
Partner 7	-0.0247	-0.0247	-0.00295	-0.0495
	(-0.55)	(-0.89)	(-0.05)	(-0.86)
Partner 8	0.00258	0.0161	0.132	-0.00602
	(0.04)	(0.40)	(1.62)	(-0.07)
Partner 9	0.100	-0.0187	0.283	-0.0195
	(0.82)	(-0.29)	(1.60)	(-0.19)
Partner 10	-0.0371	-0.0236	-0.0402	0.00507
	(-0.66)	(-0.69)	(-0.52)	(0.04)
Partner 11	-0.0129	-0.0437	0.0409	-0.0914
	(-0.22)	(-1.18)	(0.55)	(-1.58)
Partner 12	0.0870	0.0829	0.0731	-0.0998
	(0.99)	(1.47)	(0.64)	(-0.71)
Partner 13	-0.0552	0.00795	0.0216	-0.0285
	(-1.00)	(0.24)	(0.29)	(-0.46)
Partner 14	-0.0487	0.00709	-0.0940	0.0247
	(-0.49)	(0.12)	(-0.97)	(0.24)
Constant	-0.321**	0.0145	-0.210	-0.392**
	(-2.89)	(0.22)	(-1.51)	(-2.87)
Observations	255	278	324	113
Pseudo R^2				

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$