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Transaction Complexity and the Movement to Fair Value Accounting

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Abstract

Our global economy has pushed the complexity of business transactions to a new level, as companies now employ sophisticated contracts and financial instruments. However, it is unclear whether accounting standards are able to effectively capture transaction complexity, which has been growing at a rapid pace. In this study, we examine three questions related to transaction complexity: (1) Do accounting standards reflect differences in the complexity of the transactions being recorded? (2) Does the use of mark-to-market (i.e., fair value) accounting reduce the complexity of standards by relying on market valuations to capture transaction complexity? (3) Does the reliance on fair value measurements reduce audit costs for transactions with significant complexity? Our findings suggest that complex transactions result in complex accounting guidance, making the standards difficult to read and understand. However, the use of fair value accounting might be a solution to the challenges arising from transaction complexity. Our study informs regulatory bodies, investors, creditors, and public companies that are increasingly concerned about the state of financial reporting standards, which arguably have become very costly to implement yet less effective in communicating the economic substance of complex transactions.

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Transaction Complexity and the Movement to Fair Value Accounting

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The knowledge economy has increased the complexity of business activities. Business transactions have evolved from simple exchanges of goods and services to exchanges involving sophisticated contracts and financial instruments. The proliferation of complex securities and derivatives, where dramatic uncertainty and contingencies exist, makes it difficult even for the profession and practice of law (Lipshaw 2005). Furthermore, organizations have become interdependent, since they engage in integrating and coordinating business processes (Ketchen, Crook, and Craighead 2014; Larsen, Manning, and Pedersen 2013). Increased transaction complexity follows from intertwined business relationships (Zhou 2012; Ding, Dekker, and Groot 2013).

Yet, it is unclear how current accounting and reporting standards anticipate the new complexities and uncertainties of business transactions. On the one hand, complex transactions demand that accounting standards become increasingly complex as well (see, e.g., Thornton 2016). Importantly, the history and development of accounting thought, theory, and standards have been intertwined with broad economic development in a reciprocal linkage. Accounting is considered one of the oldest human recordkeeping systems and is designed to support commerce.[2] Accounting is arguably an economic institution that always evolves in response to

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[2] Luca Pacioli is often hailed as the father of accounting. While he was not the inventor of the system of double-entry bookkeeping, he was the first who described it systematically in his book, *Summa de Arithmetica, Geometrica, Proportioni et Proportionalita*, published in 1494. Double-entry bookkeeping is still the basis of today's accounting systems. See Sangster (2016) for details of the genesis of double-entry bookkeeping.

market forces (Waymire and Basu 2008; Watts and Zuo 2016). As such, accounting practices and standards are expected to adapt to transaction complexity.

On the other hand, Dye, Glover, and Sunder (2015) aptly argue that formulating complex accounting standards in response to transaction complexity can be problematic. They assert that it is not feasible for accounting standard-setters to incessantly promulgate complex rules in order to win the "arms race" against the development of transaction complexity. Innovations in transaction complexity escalate rapidly because sophisticated financial experts continuously engineer transactions to keep up with modern economies (Glode, Green, and Lowery 2012). In contrast, new accounting rules take years to develop. The development of accounting theory combined with financial reporting standards due to changes in the level of complexity underlying business transactions and activities has been somewhat simultaneous, with both theory and standards usually lagging behind the development in commerce. Accordingly, to some extent, accounting has always been playing catch-up with the underlying business transactions.

Dye, Glover, and Sunder (2015) also point out that the desire to constantly update standards may lead standard-setters to write overly detailed and complex rules that, ironically, result in suboptimal financial reporting. In a similar vein, Lev and Gu (2016) claim that accounting regulation has grown excessively complicated in response to the complexity of the business environment. They describe this phenomenon as "the Lev-Gu law of the dynamics of regulation," which means that "regulatory systems strive to be even more complex than the structures or institutions they were charged to regulate" (2016, 221). Lev and Gu argue that the escalation of accounting complexity is a major reason for the deterioration of usefulness in accounting information. The increase in accounting complexity makes accounting information

difficult to decipher. At the same time, the information is losing its relevance because accounting standards are unable to capture all the nuances of business complexity (Lev and Gu 2016).

The first objective of our study is to find empirical evidence that the complexity in the underlying transactions is manifested in the complexity of the authoritative guidance used in the affiliated reporting standards.[3] Our investigation draws upon a fundamental notion in systems theory, which dictates that all control mechanisms, including accounting regulation, require a more complex mechanism than the process or activity being controlled.[4] Our findings support this argument. Next, our study examines the economic consequences of accounting complexity. Specifically, we show that an audit fee premium is placed on complex transactions. In addition, we conjecture that the use of fair values for financial accounting and reporting is more effective than overly complex accounting standards to cope with the increase in transaction complexity. Supporting our hypothesis, our study suggests that the audit fee premium is mitigated when using fair values instead of complex authoritative guidance. Drawing on this finding, our study provides insights into the development of accounting standards moving toward a fair value approach.

In the following sections, we discuss a paradigm for thinking about financial accounting and reporting standards setting. Then, we elaborate on our research questions as well as describe the research processes we employed and the results we obtained. Last, we summarize our inferences and their implications for theory and practice.

[3] Sargut and McGrath (2011) differentiate between *complex* and *complicated* in a business context. They argue that the term *complicated* denotes multiple components where the combination results in a predictable outcome, while the term *complex* denotes an individual component or multiple components in which the outcome is much less certain. Our definition of complexity is intended to capture both terms.

[4] Based on this theory, our perspective concurs with the Baruch-Lev law of the dynamics of regulation.

Theoretical Framework and Hypothesis Development

Fundamental Paradigm of Accounting Standard Setting

Since accounting is a human contrived system, accountancy theory and practice are determined by consensus regarding (1) *what* is to be measured, (2) *when* it is to be measured (recognized or derecognized), (3) *how* it is measured, (4) *who* is the entity for which the accounting occurs, and (5) *where* the element or activity takes place. While the genesis of this paradigm is uncertain, Wallman (1995, 1996) uses a similar approach in discussing accounting and disclosure issues facing the profession. In essence, accounting and disclosure issues can be considered a question or a combination of questions regarding the following:

Issues of definition. Does the transaction result in an identifiable element that meets the criteria needed to be an asset, liability, equity, revenue, expense, gain, loss, or income (earnings)?

Issues of timing. When does the transaction or an event result in a cue for recognition, de-recognition, revaluation, or allocation?

Issues of measurement. If a transaction meets the definition of an element and the timing cue is met, should the element's value be measured based on its historical value, current value (including current entry value and current exit value), or expected future value?

Issues of reporting entity. What is the boundary that defines the reporting entity? Does the transaction take place within the reporting entity boundary or does it span the boundary (such that it is deemed an arm's-length transaction)? Determining the entity's external or internal boundary may determine or impact issues of definition, timing, or measurement. For example, consolidation requires the elimination of intra-entity profits and losses (a form of derecognition).

Issues of geographical location. In instances where the geographical location attributable to the transaction is important, the location may need to be determined.

Research Question 1: Transaction and Accounting Complexity

The complexity of a transaction can impact any individual issue or a combination of issues within the paradigm above. We expect that the complexity of a transaction will be manifested in the affiliated financial accounting or reporting pronouncement. To define accounting complexity, we follow the definition from the SEC's Advisory Committee on Improvements to Financial Reporting (ACIFR), which highlights various causes of accounting complexity. One possible cause is the complex nature of business activities. Another is financial standards that enumerate detailed guidance or lack the use of simple terms (i.e., plain English) due to the challenge in describing sophisticated transactions (SEC 2008).

Based on the ACIFR's definition, we argue that the readability level of a pronouncement captures the complexity of an underlying transaction that the pronouncement is written to cover.[5] A complex transaction requires a more detailed, complex explanation in the affiliated pronouncement, making the descriptions in the pronouncement harder to explain in plain English. In contrast, simple or less complex transactions will result in simpler language for the affiliated pronouncements. Stated formally, our first research question is as follows:

[5] Prior work in accounting does not offer a formal definition of accounting complexity. For example, Peterson (2012) does not distinguish between complex accounting guidance and complex transactions, claiming that it is impossible to differentiate the two. Other studies (see, e.g., Miller 2010; Rennekamp 2012) assert that financial reports have become overly complex and challenging for an average investor to understand, but these studies do not identify or examine the sources of accounting complexity.

RQ1: Do accounting standards reflect differences in the complexity of the transactions being recorded? Specifically, does the complexity of a transaction manifest in its affiliated pronouncement?

Research Question 2: Transaction Complexity and Fair Value Accounting

Our contention is that the evolving complexity of transactions will continue and that authoritative pronouncements will continue to be difficult to read and understand since writing standards to address the *what*, *when*, *how*, *who*, and *where* questions will require even higher levels of readability. However, the use of mark-to-market (fair value) accounting may simplify the authoritative pronouncement, since fair values are the result of a complex process that readily addresses the difficult *what*, *when*, *how*, *who*, and *where* questions or issues through the invisible hand of the market. Market values represent a consensus that spans all attributes of the underlying transactions (at least, all attributes that are known by the market participants) and readily incorporates dealing with issues of definition, timing, and measurement. Reliance on market values may greatly simplify the difficulties of writing standards since the standard will not need to provide explicit authoritative guidance regarding the issues of definition, timing, and measurement.[6]

To test this conjecture, we will focus our analyses on a specific pronouncement: SFAS No. 157 (Fair Value Measurements). This pronouncement defines three measurement hierarchies to value assets or liabilities. The highest is Level 1, which indicates the existence of active markets for the assets or liabilities to be valued. Accordingly, the assets or liabilities can be

[6] Our conjecture is consistent with the ACIFR's recommendation to reduce financial reporting complexity. The committee recommends "a judicious approach to expanding the use of fair value" and staying away from the mixed attribute models, whenever possible, since the complexity often arises from using those models (SEC 2008).

measured reliably using quoted prices. The second level is Level 2, which indicates the existence of active markets or quoted prices for *similar* assets or liabilities. Level 3 is the lowest measurement level. It requires the highest involvement because no active market is available for the specific assets or liabilities. Accordingly, the measurement is more complex than using quoted prices because it requires various assumptions, information, and a measurement approach to be defined and applied.

We expect that Level 1 should be easier to read than that of Levels 2 or 3 because Level 1 measures asset and liability values directly using market prices, avoiding complexity.

> **RQ2:** Does the use of fair value accounting reduce the complexity of standards by relying upon market valuations to capture transaction complexity? Specifically, is the readability of Level 1 described in SFAS 157 lower than the readability of Levels 2 or 3?

Research Question 3: Transaction Complexity and Audit Fees

We argue that complex transactions increase audit fees because they are difficult for auditors to measure and verify.[7] In addition, we expect that the use of fair values can mitigate the audit fee premium. Specifically, we argue that it takes less effort to audit assets and liabilities using the Level 1 measurement than to audit assets and liabilities using Level 2 or 3 measurements. This reduced audit effort will be reflected in a lower audit fee. Stated formally, our third question is as follows:

> **RQ3:** Does the reliance upon fair value measurements reduce audit costs for transactions with significant complexity? Specifically, are the audit fees for Level 1 assets and liabilities lower than the audit fees for Level 2 or 3 assets and liabilities?

[7] In June 2014, the Financial Accounting Standards Board (FASB) launched the Simplification Initiative, a series of projects that aim to simplify GAAP, reducing the cost and complexity of financial reporting (FASB 2014).

Research Methods

Question 1: Analysis of Readability of Standards and Underlying Transaction Complexity

To investigate our first and second research questions, we start by measuring the readability score of various transactions. We then employ a survey to collect responses from accounting experts. The objective of our survey is to ask experts to categorize selected transactions as either the most or the least complex transaction group. After obtaining two groups of transactions based on their perceived complexity, we analyze whether this classification corresponds to its readability level.

Readability Scores of Pronouncements

We select 30 accounting transactions prescribed by pronouncements issued by the Financial Accounting Standards Board (FASB) from 1973 through 2009. We believe that our selection covers prevalent transactions that vary widely in the levels of transaction complexity. Then we measure the readability score of each pronouncement using the Flesch-Kincaid Index, a widely known readability measure. The Flesch-Kincaid Index is a function of two variables: average sentence length (in words) and complex words (based on the percentage of words with many syllables). The score generated by this index indicates the minimum school level appropriate for comprehending the text being measured. For example, if the Flesch-Kincaid score of a text is 10, it means that the text is best understood by average students with a 10th grade reading level and above. Table 1 summarizes the readability scores of all the pronouncements we include in our analysis.

Table 1: Readability Scores of Selected FASB Pronouncements

Transaction types	Affiliated pronouncement	Flesch-Kincaid Score
Postretirement benefit obligations other than pensions	SFAS 106	17.16
Financial instruments with both debt and equity characteristics	SFAS 150	16.30
Compensated absences	SFAS 43	15.67
Comprehensive income	SFAS 130	15.64
Financial instruments	SFAS 105	15.55
Business segments	SFAS 14	15.28
Defined benefit pensions	SFAS 35	15.27
Contributions made or received	SFAS 116	15.13
Mortgage origination, mortgage-backed securities, long-term loan servicing	SFAS 65	15.05
Defined benefit pensions, defined contribution pensions	SFAS 87	14.98
Liability extinguishment	SFAS 125	14.97
Depreciation for not-for-profit entities	SFAS 93	14.77
Foreign currency translation	SFAS 52	14.75
Derivative instruments	SFAS 80	14.64
Business combinations	SFAS 141	14.63
Related party transactions	SFAS 57	14.42
Derivative instruments, hedging activities	SFAS 133	14.27
Long-term obligations	SFAS 47	14.18
Accounting changes, error corrections	SFAS 154	14.12
Leases	SFAS 13	13.89
Income taxes	SFAS 96	13.85
Asset impairment, long-lived asset disposal	SFAS 144	13.42
Subsequent events	SFAS 165	13.37
Research and development costs	SFAS 2	13.36
Revenue recognition with right of return	SFAS 48	13.21
Prior period adjustments	SFAS 16	12.94
Mean readability score		**14.65**

Table 1 shows that the mean readability score is 14.65, which indicates that accounting standards appear to be difficult to read. The most difficult pronouncement to read in our set is SFAS No. 106 (readability score = 17.16), which guides transactions related to postretirement benefit obligations other than pensions. The easiest pronouncement to read is SFAS No. 16 (readability score = 12.94), the guidance for prior-period adjustments.

Survey Design and Delivery

We designed our survey instrument using Qualtrics, a web-based survey tool. We used the preliminary version of our survey to run a pilot test and obtain feedback from eight doctoral students at the University of Kentucky. The purpose of the pilot test was to measure the time required to complete the survey.

Based on the responses from the pilot test, we finalized the survey instrument and invited accounting faculty members at the University of Kentucky and the University of Wisconsin-Madison to participate in our survey. We used email to distribute our survey link to faculty. The survey was administered over the Internet and was anonymous. We emailed the invitation to participate in the survey on August 1, 2016. We received the last response on August 17, 2016.

The survey asked participants to select at least 20 out of 30 transactions that participants believed they had familiarity with or knowledge of. To mitigate order effects, we randomized the order of the selection list. Given their choice sets, participants had to classify transactions into the most and the least complex transaction groups, respectively. Participants were told that each group should contain at least five transactions and that the order of the selection did not matter. We administered brief demographic questions at the end of the survey.

Summary Statistics

We received 10 responses total from both the faculty of the University of Wisconsin-Madison (response rate: 100%) and the University of Kentucky (response rate: 45%). On average, participants spent 6.16 minutes to complete the survey. Table 2 reports the demographic characteristics of our participants. Sixty percent have taught financial accounting courses for one

to six years, whereas 30 percent have taught for seven years or more. Panel B of table 2 reports the participants' self-assessment rating of their familiarity with accounting pronouncements on a scale of 1 to 7, where higher values correspond to higher knowledge and understanding. The mean (median) of rating is 4.2 (4.0), signifying that our participants view themselves to have fairly significant knowledge regarding accounting pronouncements.

Table 2: Demographic Characteristics of Survey Participants

Panel A: Participants' teaching experience in selected accounting courses

	Financial accounting	Managerial accounting	Auditing	Accounting information systems	Taxation	Other
None	1	4	4	10	8	8
1–3 years	5	3	1	0	0	0
4–6 years	1	0	2	0	0	0
7–10 years	2	1	1	0	1	1
> 10 years	1	2	2	0	1	1

Panel B: Self-assessment of familiarity with accounting pronouncements (scale of 1 to 7; 7 is the highest)

	Mean	Median
Familiarity score	4.2	4.0

Table 3: Survey Responses to the Question: "Select accounting transactions you are familiar with"

Transaction	% participants (total possible $n = 10$)
Research and development costs	100
Asset impairment	100
Subsequent events	100
Prior period adjustments	100
Business segments	90
Long-lived asset disposal	90
Accounting changes	90
Error corrections	90
Long-term obligations	90
Related party transactions	90
Leases	80
Financial instruments	80
Business combinations	80
Post-retirement benefit obligations other than pensions	70
Comprehensive income	70
Defined contribution pensions	70
Contributions made or received	60
Liability extinguishment	60
Hedging activities	60
Revenue recognition with right of return	60
Foreign currency translation	60
Mortgage origination	60
Mortgage-backed securities	60
Income taxes	60
Derivative instruments	50
Financial instruments with both debt and equity characteristics	50
Defined benefit pensions	50
Compensated absences	40
Long-term loan servicing	40
Depreciation for not-for-profit entities	40

Survey Responses: Familiarity with Accounting Transactions

Table 3 presents the percent of participants stating their familiarity with a given accounting transaction. All participants claim that they are familiar with transactions pertaining to (1) research and development costs, (2) asset impairment, (3) subsequent events, and (4) prior-

period adjustments. Additionally, 90 percent of participants indicate their understanding of transactions related to (1) business segments, (2) long-lived asset disposal, (3) accounting changes, (4) error corrections, (5) long-term obligations, and (6) related party transactions. Collectively, six or more participants (out of 10 total) are familiar with 24 out of the 30 transactions listed in our survey.

Survey Responses: Transactions with the Highest Complexity

Table 4 reports the percent of participants indicating the complexity levels of a given transaction. Our survey results reveal that the most complex transactions are hedging activities (60%) and business combinations (60%). Following closely behind is financial instruments with both debt and equity characteristics (50%). Furthermore, 40 percent of our participants think that the most complex transactions are related to (1) financial instruments, (2) derivative instruments, (3) asset impairment, (4) defined benefit pensions, and (5) income taxes.

Survey Responses: Transactions with the Lowest Complexity

Seventy percent of our participants decided that the least complex transactions are those corresponding to prior period adjustments. The results in table 4 also show that the least complex transactions are related to error corrections (60%), subsequent events (50%), and long-term obligations (50%). In addition, 40 percent of our participants believe that transactions concerning (1) research and development costs, (2) contributions made or received, (3) long-lived asset disposal, and (4) accounting changes fall into the least complex transaction group.

Table 4: Survey Responses to the Question: "Perceived complexity levels of accounting transactions"

Transaction	% highest complexity (total possible *n* = 10)	% lowest complexity (total possible *n* = 10)	Readability score
Hedging activities	60	0	14.27
Business combinations	60	10	14.63
Financial instruments with both debt and equity characteristics	50	0	16.30
Financial instruments	40	0	15.55
Derivative instruments	40	0	14.64
Defined benefit pensions	40	0	15.27
Income taxes	40	0	13.85
Asset impairment	40	10	13.42
Postretirement benefit obligations other than pensions	30	0	17.16
Leases	20	0	13.89
Revenue recognition with right of return	20	0	13.21
Mortgage-backed securities	20	0	15.05
Foreign currency translation	20	30	14.75
Related party transactions	20	30	14.42
Accounting changes	20	40	14.12
Long-term loan servicing	10	0	15.05
Business segments	10	10	15.28
Subsequent events	10	50	13.37
Prior period adjustments	10	70	12.94
Comprehensive income	0	10	15.64
Liability extinguishment	0	20	14.97
Compensated absences	0	20	15.67
Mortgage origination	0	20	15.05
Depreciation for not-for-profit entities	0	20	14.77
Research and development costs	0	40	13.36
Contributions made or received	0	40	15.13
Long-lived asset disposal	0	40	13.42
Long-term obligations	0	50	14.18
Error corrections	0	60	14.12

Statistical Test of a Difference in Readability Levels for High and Low Transaction Complexity

To test for a difference in the pronouncement complexity of the topic areas identified as being the most complex versus those identified as being the least complex, we first computed the mean

of the readability score for the two groups (the most and the least complex). The mean for each group is based on at least 40 percent of the respondents identifying the topic as being the most complex or the least complex. Next, we weight the readability score by the number of participants identifying the topic as either in their most complex or their least complex grouping. This resulted in a mean readability score of 14.78 for the most complex group and a mean readability score of 13.71 for the least complex group. The difference in means is 1.07.

To test for the statistical significance of this difference, we employ a computer intensive approach (Diaconis and Efron 1983). The use of a resampling method is quite applicable given our small number of observations, and it replaces the necessity of the Gaussian assumptions of classical statistical methods via computation power (Diaconis and Efron 1983). This "allows us to be free of the non-bell-shapeness" that may not exist in our data (Diaconis and Efron 1983, 2).

We employ a "hypothesis test for a difference in means" described by Simon (1999, 38–39). Our null hypothesis is that there is no difference in the readability scores of the transaction-associated pronouncements identified as being the most complex or least complex. In essence, we compute the probability that the observed difference in the mean readability scores for the high complexity and low complexity groups (14.78 – 13.71 = 1.07) would be observed if the two groups are drawn from the same population. We use 10,000 iterations with replacement (a bootstrap procedure) and find that the probability is less than 0.01 percent that a difference of 1.07 would be observed if both groups are drawn from the same underlying distribution. Note that this is, in essence, the type 1 error. Our choice of sampling with replacement is likely to result in a conservative type 1 error since an observation can be chosen more than once in a single iteration.

To answer our first question, we find that the readability levels of the accounting pronouncements associated with the groups of transactions identified as high complexity and low complexity are significantly different, and the underlying transaction complexity is manifested in a higher readability level for the associated pronouncement. In essence, a more complex (higher reading level) pronouncement is needed for transactions that are more complex.

Question 2: Analysis of Readability of SFAS No. 157

To answer our second question, we focus our analysis on SFAS No. 157. The readability score of SFAS No. 157, Fair Value Measurements, is 14.08 for the entire pronouncement (including appendixes). For the main standard discussion, the readability score is 14.76. For the sections related to the Fair Value Hierarchy, Level 1 Inputs, Level 2 Inputs, and Level 3 Inputs, the overall readability score is 16.5. The readability scores for the specific sections regarding Level 1 Inputs, Level 2 Inputs, and Level 3 Inputs are 15.5, 17.5, and 16.7, respectively. These readability scores significantly exceed the readability scores associated with complex topics identified in the prior section of this study, where the mean is 14.78. The findings show that the readability score of Level 1 is lower than the scores of Level 2 or Level 3.

We interpret this finding to suggest that the transactions underlying SFAS No. 157 are quite complex. This is not surprising, given that the examples discussed in the Implementation Guidance section of the pronouncement contain transactions or situations such as a business combination, in-process research and development in a business combination, asset impairment, software assets, interest rate swap and other types of derivatives, and restricted assets.

Question 3: Analysis of Audit Pricing Evidence Where Underlying Complex Transactions Are Accounted for Using Mark-to-Market

Overview of Analyses

We analyze two samples. One is comprised of nonfinancial companies, while the other consists of financial companies. We use two different research models to analyze the effect of fair value measurement on audit fees. First, we use Model 1 to examine the sample of nonfinancial firms following prior literature (Hribar, Kravet, and Wilson 2014; Francis, Reichelt, and Wang 2005; Ghosh and Lustgarten 2006; Bills, Lisic, and Seidel 2016) and include a fair value measure. The resulting model, including industry and year fixed effects, is specified as:

$$Ln(AUDIT\ FEE)_{i,t} = \beta_0 + \beta_1 Fair\ Value_{i,t} + \beta_2 BIG4_{i,t} + \beta_3 FGN_{i,t} +$$
$$\beta_4 Ln(ASSETS)_{i,t} + \beta_5 INV_{i,t} + \beta_6 REC_{i,t} + \beta_7 CR_{i,t} + \beta_8 BTM_{i,t} + \beta_9 LEV_{i,t} +$$
$$\beta_{10} EMPLS_{i,t} + \beta_{11} MERGER_{i,t} + \beta_{12} NDEC\_YE_{i,t} + \beta_{13} ROA_{i,t} + \beta_{14} LOSS_{i,t} +$$
$$\beta_{15} AUD\ OPIN_{i,t} + \beta_{16} LITRISk_{i,t} + \beta_{17} SEGMENT_{i,t} + \varepsilon_t \quad (1)$$

The dependent variable is *Ln (AUDIT FEE)*, which is the natural-log-transformed value of audit fees from the Audit Analytics database. The variables of interests are *FV_TT*, *FV1_TA*, *FV2_TA*, *FV3_TA*, and are defined as fair-valued asset and liability amounts measured using Level 1, Level 2, and Level 3 inputs and deflated by total assets.[8]

For the control variables, we include *Ln(ASSETS)*, *FGN*, *INV*, *REC*, *CR*, *BTM*, *LEV*, *EMPLS*, *MERGER*, and *NDEC_YE* to control for audit complexity and resource demands; *ROA*

[8] We use the proportions of fair-valued assets rather than log-transformed amounts of fair-valued assets as test variables because the correlations with control variables are much lower (Ettredge, Xu, and Yi 2014). We also run the analysis with the proportions of fair-valued assets only. In the untabulated results, we obtain similar results and inferences when we use the proportions of fair-valued assets only.

and *LOSS* control for the inherent risk related to poor performance, which leads to increased audit effort; and *LITIG,* an indicator variable for industries with higher litigation risk. [9]

We use Model 2 to examine the sample of financial firms specified following Ettredge, Xu, and Yi (2014) and Fields, Fraser, and Wilkins (2004) as:

$$Ln(AUDIT\ FEE)_{i,t} = \beta_0 + \beta_1 Fair\ Value_{i,t} + \beta_2 Ln(ASSETS)_{i,t} + \beta_3 FGN_{i,t} + \beta_4 LOSS_{i,t} + \beta_5 STDRET_{i,t} + \beta_6 TRANSACCT_{i,t} + \beta_7 SECURITIES_{i,t} + \beta_8 EFFICIENCY_{i,t} + \beta_9 COMMLOAN_{i,t} + \beta_{10} NONPERFORM_{i,t} + \beta_{11} CHGOFF_{i,t} + \beta_{12} MTGLOAN_{i,t} + \beta_{13} CAPRATIO_{i,t} + \beta_{14} INTANG_{i,t} + \beta_{15} SENSITIVE_{i,t} + \beta_{16} SAVINGS_{i,t} + \varepsilon_t \quad (2)$$

The dependent variable is *Ln(AUDIT FEE),* a natural-log-transformed value of audit fees. The variables of interest are the fair-valued asset and liability amounts deflated by total assets. The control variables are proportion of transaction account (*TRANSACCT*), proportion of securities (*SECURITIES*), efficiency ratio (*EFFICIENCY*), common loans (*COMMLOAN*), nonperforming loans (*NONPERFORM*), net charge-offs (*CHGOFF*), capital ratio (*CAPRATIO*), intangible assets (*INTANG*), sensitivity (*SENSITIVE*), and savings institution (*SAVINGS*). Fields, Fraser, and Wilkins (2004) expect all the coefficients except that on *SENSITIVE* to be positive, and find that the coefficients on *LOGTA, BIGN, TRANSACCT, SECURITIES, EFFICIENCY, COMMLOAN, NONPERFORM, CHGOFF, CAPRATIO, INTANG,* and *SAVINGS* are positive and significant at the 0.10 (one-sided) level or better. The details of variables definition are in appendixes A and B.

[9] Developed by Francis, Philbrick, and Schipper (1994), this measure controls for four industries with a high incidence of litigation, which would lead auditors to charge higher fees.

Nonfinancial Firms Sample Results

Sample

Table 5 presents the sample selection procedure for our audit fee Model 1, where we extract financial data from Compustat and audit fee data from Audit Analytics. We collect our initial sample of 80,693 firm-year observations from Compustat for the years 2008 to 2015. We exclude all 29,546 firm-year observations from the financial services industries (SIC code 60–69). Next, we require firm-year observations to have audit fee data available in Audit Analytics; this requirement eliminates 14,564 firm-year observations. Last, we exclude 13,961 firm-year observations that lack the necessary data to calculate control variables. Our final sample comprises 48,795 firm-year observations.

Table 5: Sample Development for Nonfinancial Firms

	Number of firm years
Total firm-year observations available in Compustat, 2007– 2015	80,693
Less:	
Observations from financial services industries	-28,798
Observations without information to calculate audit fee	-13,483
Observations with insufficient data to calculate control variables	-19,047
Final sample	19,365

Table 6 reports the descriptive statistics for our sample. We report the mean of our dependent variable *Ln(AUDITFEE)* as 13.74, which is consistent with Ettredge, Xu, and Yi (2014). Additionally, the descriptive statistics of the audit fee determinants are consistent with levels reported in prior literature (Simunic 1980; Hribar, Kravet, and Wilson 2014).

Table 6: Descriptive Statistics for Nonfinancial Firms

Variable	N	Mean	Median	Std Dev	25%	75%
ln_fee	19,365	13.740	13.826	1.417	12.899	14.644
fairlv_tt	19,365	0.221	0.070	0.394	0.012	0.291
fairlv1	19,365	0.100	0.009	0.187	0.000	0.113
fairlv2	19,365	0.069	0.004	0.153	0.000	0.044
fairlv3	19,365	0.038	0.000	0.208	0.000	0.004
dummylv_tt	19,365	0.977	1.000	0.149	1.000	1.000
dummy_lv1	19,365	0.674	1.000	0.469	0.000	1.000
dummy_lv2	19,365	0.681	1.000	0.466	0.000	1.000
dummy_lv3	19,365	0.350	0.000	0.477	0.000	1.000
frass_lv1	19,365	0.094	0.007	0.182	0.000	0.101
frlia_lv1	19,365	0.004	0.000	0.029	0.000	0.000
frass_lv2	19,365	0.051	0.000	0.130	0.000	0.016
frlia_lv2	19,365	0.017	0.000	0.073	0.000	0.003
frass_lv3	19,365	0.006	0.000	0.031	0.000	0.000
frlia_lv3	19,365	0.032	0.000	0.202	0.000	0.000
big4	19,365	0.741	1.000	0.438	0.000	1.000
ln_at	19,365	6.332	6.421	2.476	4.809	8.029
Inv	19,365	0.090	0.043	0.119	0.000	0.139
Rec	19,365	0.133	0.103	0.131	0.044	0.179
Cr	19,365	2.993	1.939	3.698	1.206	3.296
Btm	19,365	0.477	0.444	1.263	0.213	0.764
Lev	19,365	0.333	0.193	0.750	0.010	0.390
Empls	19,365	2.146	1.222	2.584	0.464	2.757
Merger	19,365	0.367	0.000	0.482	0.000	1.000
ndec_ye	19,365	0.265	0.000	0.442	0.000	1.000
Roa	19,365	-0.158	0.058	1.258	-0.040	0.117
Loss	19,365	0.536	1.000	0.499	0.000	1.000
Mao	19,365	0.271	0.000	0.445	0.000	1.000
Litig	19,365	0.377	0.000	0.485	0.000	1.000
Segment	19,365	1.546	1.000	0.960	1.000	2.000

Table 7: Fair Value and Audit Fee for Nonfinancial Companies

Variables	1	2	3	4	5	6	7	8	9	10
FairValue_tt	0.100***									
	(4.86)									
FairValue-1		0.162*			0.092**					
		(3.59)			(2.15)					
FairValue-2			0.049		0.075					
			(0.97)		(1.48)					
FairValue-3				0.099***	0.110***					
				(2.78)	(3.09)					
Dummy_FV_tt						0.063*				
						(1.74)				
Dummy_FV1							0.055***			0.054***
							(3.19)			(3.39)
Dummy_FV2								0.006		0.029*
								(0.728)		(1.79)
Dummy_FV3									0.043***	0.052***
									(2.95)	(3.60)
big4	0.500***	0.503***	0.504***	0.506***	0.502***	0.491***	0.501***	0.505***	0.509***	0.503***
	(21.72)	(21.8)	(21.87)	(22.03)	(21.71)	(20.07)	(21.8)	(21.95)	(22.16)	(22.15)
ln_at	0.436***	0.433***	0.432***	0.434***	0.436***	0.434***	0.431***	0.432***	0.431***	0.426***
	(66.85)	(67.04)	(67.24)	(66.67)	(66.39)	(62.03)	(67.04)	(65.30)	(67.46)	(65.50)
inv	0.075	0.048	0.042	0.038	0.064	0.014	0.043	0.032	0.039	0.041
	(0.9)	(0.57)	(0.50)	(0.45)	(0.76)	(0.20)	(0.51)	(0.38)	(0.46)	(0.50)
rec	0.415***	0.388***	0.387***	0.391***	0.407***	0.337***	0.387***	0.383***	0.383***	0.403***
	(6.39)	(6.00)	(5.98)	(6.06)	(6.26)	(4.96)	(6.01)	(5.94)	(5.93)	(6.39)
cr	-0.023***	-0.022***	-0.021***	-0.021***	-0.022***	-0.019***	-0.022***	-0.021***	-0.021***	-0.021***
	(-11.06)	(-10.49)	(-10.37)	(-10.15)	(-10.48)	(-7.85)	(-10.69)	(-10.31)	(-10.19)	(-10.48)
btm	-0.045***	-0.047***	-0.047***	-0.046***	-0.045***	-0.086***	-0.047***	-0.047***	-0.047***	-0.045***
	(-6.87)	(-7.10)	(-7.10)	(-7.03)	(-6.92)	(-8.91)	(-7.16)	(-7.14)	(-7.10)	(-7.16)
lev	-0.052***	-0.038***	-0.039***	-0.045***	-0.046***	-0.067***	-0.036***	-0.038***	-0.039***	-0.037***
	(-4.35)	(-3.29)	(-3.42)	(-3.84)	(-3.93)	(-5.04)	(-3.12)	(-3.36)	(-3.38)	(-3.36)

Table 7 (continued)

Variables	1	2	3	4	5	6	7	8	9	10
empls	0.062***	0.062***	0.062***	0.061***	0.062***	0.056***	0.062***	0.062***	0.062***	0.064***
	(11.37)	(11.49)	(11.47)	(11.26)	(11.31)	(10.08)	(11.35)	(11.42)	(11.50)	(11.80)
fgn	0.016	0.012	0.016	0.015	0.015	-0.023	0.016	0.015	0.012	0.026
	(0.29)	(0.22)	(0.28)	(0.27)	(0.27)	(-0.39)	(0.28)	(0.27)	(0.23)	(0.46)
merger	0.113***	0.112***	0.111***	0.110***	0.113***	0.099***	0.111***	0.110***	0.108***	0.112***
	(8.11)	(8.01)	(7.94)	(7.90)	(8.08)	(6.83)	(7.99)	(7.90)	(7.74)	(8.14)
ndec_ye				0.008	0.009	0.010	0.005	0.007	0.008	0.006
				(0.42)	(0.44)	(0.47)	(0.27)	(0.38)	(0.40)	(0.33)
roa	-0.031***	-0.036***	-0.036***	-0.033***	-0.032***	-0.051***	-0.036***	-0.036***	-0.035***	-0.035***
	(-4.62)	(-5.29)	(-5.33)	(-4.90)	(-4.78)	(-5.18)	(-5.31)	(-5.34)	(-5.20)	(-5.22)
loss	0.182***	0.180***	0.180***	0.182***	0.181***	0.192***	0.183***	0.181***	0.179***	0.183***
	(11.28)	(11.15)	(11.17)	(11.28)	(11.21)	(11.51)	(11.31)	(11.21)	(11.11)	(11.49)
mao	0.094***	0.097***	0.096***	0.092***	0.094***	0.073***	0.097***	0.095***	0.091***	0.094***
	(6.53)	(6.71)	(6.66)	(6.39)	(6.51)	(4.61)	(6.76)	(6.63)	(6.32)	(6.58)
litig	0.025	0.031	0.033	0.035*	0.027	0.033	0.029	0.035*	0.031	0.023
	(1.19)	(1.46)	(1.55)	(1.67)	(1.23)	(1.50)	(1.36)	(1.65)	(1.47)	(1.06)
Segment	0.058***	0.057***	0.057***	0.057***	0.058***	0.057***	0.055***	0.057***	0.056***	0.054***
	(5.84)	(5.82)	(5.75)	(5.73)	(5.83)	(5.73)	(5.56)	(5.73)	(5.70)	(5.48)
Intercept	9.953***	9.988***	10.010***	9.986***	9.951***	10.232***	9.974***	10.003***	10.000***	9.948***
	(65.02)	(65.59)	(66.26)	(65.84)	(65.15)	(60.77)	(65.68)	(66.11)	(66.34)	(66.37)
Industry&Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	19,365	19,365	19,365	19,365	19,365	19,365	19,365	19,365	19,365	19,365
Adjusted R^2	0.824	0.824	0.824	0.824	0.824	0.821	0.824	0.824	0.824	0.825

Note: Our audit fee regression model includes fair value measurement variables. The resulting model, including industry and year fixed effects, is specified as:
$Ln(AUDIT\ FEE)_{i,t} = \beta_0 + \beta_1 Fair\ Value_{i,t} + \beta_2 BIG4_{i,t} + \beta_3 FGN_{i,t} + \beta_4 Ln(ASSETS)_{i,t} + \beta_5 INV_{i,t} + \beta_6 REC_{i,t} + \beta_7 CR_{i,t} + \beta_8 BTM_{i,t} + \beta_9 LEV_{i,t} + \beta_{10} EMPLS_{i,t} + \beta_{11} MERGER_{i,t} + \beta_{12} NDEC\_YE_{i,t} + \beta_{13} ROA_{i,t} + \beta_{14} LOSS_{i,t} + \beta_{15} AUD\ OPIN_{i,t} + \beta_{16} LITIG_{i,t} + \beta_{17} SEGMENT_{i,t} + \varepsilon_t$

Regression Analysis Results

Table 7 reports the results of our regression audit fees, specifically *Ln(AUDIT FEE)* on our Fair Value variables along with the control variables. The results show that the total fair value amount (*FairValue_tt)* is positively and significantly (regression coefficient of 0.100 with a t-statistic of 4.86) associated with audit fees. The results imply that the fair value measurements increase the audit efforts and are reflected in a higher audit fee. We also investigate the fair value amounts by breaking down total fair value amount (*FairValue_tt*) into Level 1 (*FairValue-1),* Level 2 *(FairValue-2),* and Level 3 *(FairValue-3).* In most cases, we find that the estimated regression coefficient on the fair value variable is significantly positive. We also test the hypothesis by using dichotomized variables *(Dummy_FV1, Dummy_FV2, Dummy_FV3*). The results are consistent with the results based on amounts rather than the dummy variable approach.

We find that our control variables are generally consistent with prior literature. *BIG4*, *Ln(ASSETS), REC, EMPLS*, *MERGER*, *LOSS,* and *SEGMENTS* are positively associated with audit fees. The variables *CR, BTM,* and *ROA* are negatively associated with audit fees. The adjusted R^2 (0.824) is comparable with prior research (Hribar, Kravet, and Wilson 2014).

Financial Firm Sample Results

Table 8 presents the sample selection procedure for our audit fee Model 2, where we extract financial data from the Bank Holding Company dataset and audit fee data from Audit Analytics. We collect our initial sample of 5,126 firm-year observations from the Bank Holding Company for the years 2008 to 2015. We exclude 80 firm-year observations for firms with no information in Compustat and 196 firm-year observations for firms with no information from CRSP. Next, we require firm year observations to have audit fee data available in Audit Analytics; this requirement eliminates 2,170 firm-year observations. Last, we exclude 840 firm-year

observations that lack the necessary data to calculate control variables. Our final sample comprises 1,840 firm-year observations for the financial sample.

Table 8: Sample Development for Financial Firms

	Number of firm years
Total firm-year observations available in Bank Holding Company, 2007–2015	5,126
Less:	
Firms that do not have CIK or GVKEY information from Compustat and CRSP	-80
Firms that do not have valid data for the standard deviation of returns from CRSP database	-196
Firms that do not have valid and nonzero audit fee disclosure data from Audit Analytics	-2,170
Observations with insufficient data to calculate control variables	-840
Final sample	1,840

Descriptive Statistics

Table 9 reports the descriptive statistics for our sample. We report the mean of our dependent variable *Ln(AUDITFEE)* as 13.04, which is consistent with Ettredge, Xu, and Yi (2014). Additionally, the descriptive statistics of the audit fee determinants are consistent with levels reported in prior literature (Ettredge, Xu, and Yi 2014; Francis, Reichelt, and Wang 2005).

Table 9: Descriptive Statistics for Financial Firms

Variable	N	Mean	Std Dev	Median	25%	75%
ln_fee	1,840	13.041	1.248	12.797	12.202	13.596
fva_ta	1,840	0.207	0.147	0.180	0.124	0.254
fva1_ta	1,840	0.012	0.034	0.000	0.000	0.004
fva2_ta	1,840	0.188	0.133	0.170	0.110	0.239
fva3_ta	1,840	0.005	0.012	0.000	0.000	0.003
logass	1,840	14.992	1.573	14.589	13.896	15.686
bign	1,840	0.406	0.491	0.000	0.000	1.000
loss	1,840	0.190	0.392	0.000	0.000	0.000
stdret	1,840	0.103	0.073	0.080	0.057	0.124
transacct	1,840	0.673	0.159	0.694	0.573	0.793
securities	1,840	0.793	0.104	0.808	0.734	0.869
efficiency	1,840	1.193	0.281	1.155	1.029	1.293
commloan	1,840	0.165	0.105	0.144	0.090	0.215
nonperform	1,840	0.029	0.027	0.020	0.011	0.038
chgoff	1,840	0.468	0.433	0.351	0.157	0.660
mtgloan	1,840	0.734	0.177	0.779	0.660	0.859
capratio	1,840	15.197	3.429	14.785	13.235	16.665
intang	1,840	0.015	0.016	0.009	0.002	0.024
sensitive	1,840	0.098	0.186	0.100	-0.002	0.208
savings	1,840	0.055	0.229	0.000	0.000	0.000

Multiple Regression Results

Table 10 reports the results of our regression of the Fair Value measure on audit fees (*LnAUDITFEE*). Model A of table 10 tests whether the coefficient on the proportion of fair value amount differs from zero. The results show that the total fair value amount (*FairValue_tt)* is positively and significantly (regression coefficient of 0.580 with a t-statistic of 4.91) associated with audit fees for the financial firms. We also investigate the fair value amounts by breaking down total fair value amount (*FairValue_tt*) into level 1 (*FairValue-1),* level 2 *(FairValue-2),* and level 3 *(FairValue-3).* In most cases, we find that the fair value amount is significantly positive with audit fees.

Table 10: Fair Value and Audit Fee for Financial Companies

Variables	1	2
FairValue_tt	0.580***	
	(4.91)	
FairValue-1		0.317
		(0.81)
FairValue-2		0.490***
		(3.69)
FairValue-3		4.695***
		(3.61)
logass	0.592***	0.581***
	(31.47)	(31.38)
bign	0.399***	0.403***
	(9.66)	(9.87)
loss	0.017	0.015
	(0.36)	(0.33)
stdret	0.588**	0.521*
	(2.03)	(1.82)
transacct	-0.274*	-0.296**
	(-1.95)	(-2.12)
securities	0.907***	0.851***
	(4.61)	(4.33)
efficiency	0.186***	0.170***
	(3.08)	(2.79)
commloan	-0.468**	-0.434*
	(-2.06)	(-1.93)
nonperform	3.309***	3.370***
	(5.27)	(5.47)
chgoff	-0.011	-0.007
	(-0.34)	(-0.22)
mtgloan	-0.864***	-0.842***
	(-5.33)	(-5.12)
capratio	0.031***	0.030***
	(6.28)	(6.2)
intang	2.173*	2.458**
	(1.9)	(2.16)
sensitive	0.129	0.135
	(1.4)	(1.5)
savings	0.046	0.049
	(0.86)	(0.92)
Intercept	3.275***	3.500***
	(8.86)	(9.37)
Year Dummy	Yes	Yes

Table 10 (continued)

Variables	1	2
No. obs.	1840	1840
Adjusted R^2	0.9044	0.9056

Notes: Our audit fee model includes fair value measurement variables. The resulting model, including year fixed effects, is specified as:

$$Ln(AUDIT\ FEE)_{i,t} = \beta_0 + \beta_1 Fair\ Value_{i,t} + \beta_2 Ln(ASSETS)_{i,t} + \beta_3 FGN_{i,t} + \beta_4 LOSS_{i,t} + \beta_5 STDRET_{i,t} + \beta_6 TRANSACCT_{i,t} + \beta_7 SECURITIES_{i,t} + \beta_8 EFFICIENCY_{i,t} + \beta_9 COMMLOAN_{i,t} + \beta_{10} NONPERFORM_{i,t} + \beta_{11} CHGOFF_{i,t} + \beta_{12} MTGLOAN_{i,t} + \beta_{13} CAPRATIO_{i,t} + \beta_{14} INTANG_{i,t} + \beta_{15} SENSITIVE_{i,t} + \beta_{16} SAVINGS_{i,t} + \varepsilon_t$$

The estimated coefficient on the Level 1 fair value variable is .317, but it is statistically insignificant. This suggests that there is no statistically significant increase in audit fees associated with Level 1 fair values. To the contrary, the estimated coefficient on the Level 2 fair value variable is .490, and it is statistically significant at the .001 level. This suggests that audit fees are impacted when there are Level 2 fair values. For Level 3 fair values, where reliance on observable market values is not available, the estimated coefficient is 4.695 (t-value of 3.61). The magnitude of this estimated coefficient is almost 10 times larger than the estimated coefficient for Level 2 fair values. This suggests a very substantial increase in the audit fees when nonreliance on observable market values is required.

We find that our control variables are generally consistent with prior literature. *BIG4*, *Ln(ASSETS)*, *STDRET*, *SECURITIES*, *EFFICIENCY*, *NONPERFORMANCE*, *CAPRATIO*, and *INTANG* are positively associated with audit fees. The variables TRANSACACC, *COMMONLOAN*, and *MTGLOAN* are negatively associated with audit fees. The adjusted R^2 (0.904) is comparable with prior research (Ettredge, Xu, and Yi 2014).

Conclusions and Implications

Our study concludes that the complexity in underlying transactions is reflected in the readability level of the associated authoritative guidance. Our further analysis on a specific pronouncement, SFAS No. 157, finds that fair value accounting simplifies the readability level of complex transactions when the measurement of those transactions can rely on market valuation. We also show that auditing of fair values (which are associated with complex transactions) results in higher audit fees. In addition, nonreliance on market valuation (i.e., transactions measured at Level 3) will greatly exacerbate the audit fee premium.

Our inferences may have implications for future standard setting. We suggest that, in instances where quoted prices and active markets are readily available, standard-setters could simplify the complexity level of the authoritative guidance by relying on market valuation to handle complex issues related to definition, timing, and measurement. We agree with Nobes (2005) that detailed rules may not necessarily improve the accuracy of financial reporting; instead, the *reduction* of rules could increase clarity.[10]

While fair value accounting could simplify the recognition and measurement aspects in accounting standards, we recommend this approach with a caveat. Fair value accounting, unlike mixed attribute models, lacks the convergence properties (Fellingham et al. 1998). Essentially, the convergence properties induce "truth telling." That is, although reported earnings may not agree with cash flows in the short term, the properties would ensure that earnings and cash flows should converge in the long term. The convergence properties are useful for disciplining

[10] Edward Trott, a member of the FASB from October 1999 to June 2007, argues that the board tends to make piecemeal revisions to the standards (Trott 2015). Trott believes that the current standards are already overly detailed and that it would require an overhaul to simplify the standards significantly.

alternative information sources that are more timely and relevant, as market participants have an opportunity to verify the information in the near future.

In summary, the results of our study do not imply that fair value accounting is always better than accounting methods that rely on mixed attribute models. Fair value accounting might help to reduce complexity in financial reporting, but this benefit could be outweighed by deterioration in other accounting properties.[11] We believe that standard-setters should examine these trade-offs when promulgating financial reporting standards.

[11] See Nobes (2005) and Benston, Bromwich, and Wagenhofer (2006) for more discussions about the strengths and limitations of fair value accounting.

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Appendix A: Variable Definitions

Variable	Definition
Fair Value Measure	
FairValue-1	Fair-valued asset and liability amounts using Level 1 inputs scaled by total assets.
FairValue-2	Fair-valued asset and liability amounts using Level 2 inputs scaled by total assets.
FairValue-3	Fair-valued asset and liability amounts using Level 3 inputs scaled by total assets.
Fairvalue_tt	Aggregated value of fair-valued asset and liability amounts using Level 1, 2, 3.
Dummy_FV_tt	An indicator variable that equals 1 if Level 1, Level 2, or Level 3 has value, and 0 otherwise.
Dummy_FV1	An indicator variable that equals 1 if Level 1 has value, and 0 otherwise.
Dummy_FV2	An indicator variable that equals 1 if Level 2 has value, and 0 otherwise.
Dummy_FV3	An indicator variable that equals 1 if Level 3 has value, and 0 otherwise.
Audit Fee Measure	
Ln(AUDIT FEE)	Natural log of audit fee (AUDIT_FEE). Source: Audit Analytics
Audit Fee Determinants	
BIG4	Indicator variable equal to 1 when the client's auditor is a member of the Big 5 (or Big 4 after the exit of Arthur Andersen) (AUDITOR_FKEY<6) and zero otherwise. Source: Audit Analytics
Ln(ASSETS)	Natural logarithm of total assets (AT) at fiscal year-end. Source: Compustat
FGN	Indicator variable that equals 1 if the client is involved in Foreign Exchange Income (FCA), and 0 otherwise. Source: Compustat
INV	Inventory (INVT) scaled by lagged total assets (AT). Source: Compustat
REC	Receivables (RECT) scaled by lagged total assets (AT). Source: Compustat
CR	Current ratio calculated as current assets (ACT) divided by current liabilities (LCT). Source: Compustat
BTM	Market-to-book ratio at the beginning of the year measured as book value of equity (CEQ) divided by market value of equity (PRCC_F*CSHO). Source: Compustat
LEV	Sum of short-term debt (DLC) and long-term debt (DLTT) scaled by lagged total assets (AT). Source: Compustat
EMPLS	Square root of the number of employees (EMP) (measured in thousands) disclosed in Form 10-K filings. Source: Compustat

MERGER	Indicator variable that equals 1 if the client is involved in mergers or acquisitions (AQC), and 0 otherwise. Source: Compustat
NDEC_YE	Indicator variable equal to 1 if the fiscal year-end (FYR) does not end in December and 0 otherwise. Source: Compustat
ROA	Operating income after depreciation (OIADP) scaled by lagged total assets (AT). Source: Compustat
LOSS	Indicator variable equal to 1 if income before extraordinary items and discontinued operations (IB) is negative in the current or two previous years and 0 otherwise. Source: Compustat
MAO	Indicator variable equal to 1 if the client receives a modified audit opinion (AUOP) and 0 otherwise, where a modified opinion is defined as anything other than a standard unqualified audit opinion coded as one by Compustat. Source: Compustat
LITRISK	Indicator variable equal to 1 for high litigation risk industries (SIC 2833–2836; 3570–3577; 7370–7374; 3600–3674; 5200–5961; 8731–8734) and 0 otherwise, as defined in Francis, Philbrick, and Schipper (1994). Source: Compustat
SEGMENTS	Number of business segments. Source: Compustat

Appendix B: Variable Definitions

Variable	Definition
Fair Value Measure	
FairValue-1	Fair-valued asset and liability amounts using Level 1 inputs scaled by total assets.
FairValue-2	Fair-valued asset and liability amounts using Level 2 inputs scaled by total assets.
FairValue-3	Fair-valued asset and liability amounts using Level 3 inputs scaled by total assets.
Fairvalue_tt	Aggregated value of fair-valued asset and liability amounts using Level 1, 2, and 3 inputs.
Audit Fee Measure	
Ln(AUDIT FEE)	Natural log of audit fee (AUDIT_FEE). Source: Audit Analytics
Audit Fee Determinants	
BIG4	Indicator variable equal to 1 when the client's auditor is a member of the Big 5 (or Big 4 after the exit of Arthur Andersen) (AUDITOR_FKEY<6) and 0 otherwise. Source: Audit Analytics
Ln(ASSETS)	Natural logarithm of total assets (AT) at the fiscal year end. Source: Bank Holding
LOSS	Indicator variable equal to 1 if income before extraordinary items and discontinued operations (IB) is negative in the current or two previous years and 0 otherwise. Source: Bank Holding
STDRET	Standard deviation of 12-month returns ending upon the fiscal year end and measuring the operating risk of the firm. Source: CSRP
TRANSACC	Total transaction accounts deflated by total deposits. Source: Bank Holding
SECURITIES	One less total securities deflated by total assets. Source: Bank Holding
EFFICIENCY	Total operating expenses deflated by total revenue. Source: Bank Holding
COMMLOAN	The sum of commercial and agricultural loans deflated by gross loans. Source: Bank Holding
NONPERFORM	Nonperforming loans divided by gross loans. Source: Bank Holding
CHGOFF	Net charge-offs deflated by loan loss reserve. Source: Bank Holding
MTGLOAN	Total domestic real estate and home equity loans divided by gross loans. Source: Bank Holding
CAPRATIO	Total risk-adjusted capital ratio. Source: Bank Holding
INTANG	Intangible assets divided by total assets. Source: Bank Holding
SENSITIVE	The ratio of rate-sensitive assets minus rate-sensitive liabilities to total assets. Source: Bank Holding
SAVINGS	Coded as 1 if the company is a savings institution (SIC codes 6035 and 6036), 0 otherwise. Source: Bank Holding