THE EFFECT OF FOOTNOTE DISCLOSURE ON THE VALUE RELEVANCE OF BANKS' FINANCIAL DERIVATIVES: THE ROLE OF INVESTOR SOPHISTICATION

by

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To my father

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DISSERTATION

Presented to the Faculty of

The University of Texas at Dallas

in Partial Fulfillment

of the Requirements

for the Degree of

DOCTOR OF PHILOSOPHY IN

MANAGEMENT SCIENCE

THE UNIVERSITY OF TEXAS AT DALLAS

August 2019

ACKNOWLEDGMENTS

I am indebted to my supervisor, William M. Cready, for his continuous guidance throughout my dissertation process. I would not have gotten this far without his patience and full support, and I am grateful to have him as my advisor. My dissertation committee provides very helpful feedback, and I would also like to express my sincere gratitude to other committee members, Ashiq Ali, Umit G. Gurun, and Jieying Zhang, for their time and valued input.

June 2019

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This paper examines the effect of footnote disclosure and the role of investor sophistication in explaining the value relevance of banks' financial derivatives. The study focuses on the U.S. bank holding companies and their footnotes for financial derivatives around SFAS 161's enactment. By regulating footnote disclosure SFAS 161's aim is to help investors become better informed about the effects of firms' derivatives activities. Textual analysis on derivative disclosure indicates that both display and contents are changed under the standard. Empirical results show that the change is associated with higher value relevance of banks' trading derivatives. Using institutional ownership and analyst following to proxy firms' investor sophistication, the results reveal that, before SFAS 161, the firms with high investor sophistication had greater value weight on trading derivatives than did their low counterparts, but that difference narrowed after Statement 161 became effective. The new requirement not only favors the firms with low sophisticated investors but also benefits the ones with high institutional ownership. These findings confirm the positive impact brought by SFAS 161 and suggest that

investor sophistication matters to the value relevance of financial derivatives, while enhanced disclosure can reduce the role of sophistication and level the playing field for market participants.

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CHAPTER 1

INTRODUCTION

Firms facilitate their business operations partly through the use of financial instruments. With financial innovation, instruments available to firms have been increasing in both types and numbers, and companies are observed to become more deeply involved with these instruments over time. These innovative instruments are designed to address financial needs of all kinds, each instrument targeting toward a specific purpose so that the instruments share less in common in terms of characteristics and payoff pattern. It has become an onerous task for firms to measure and present these instruments on their financial statements. While these statements are only supposed to provide a summary of firms' operation results and financial position that allows their users to predict firms' future cash flows and assess current value, to compensate the loss due to the aggregation process of accounting recognition, investors need supplemental information and accounting discretion from management to assist in their assessment.

Accounting discretion, however, provides a room for management to engage opportunistic accounting behaviors, especially when financial instruments are complex and where auditors find it relatively difficult to challenge managers' assertions. Current practice reveals that both preparers and auditors heavily rely on accounting standards for guidance. Since historical cost measurement fails to deliver timely relevant information to the users, fair value is considered the favorable way to measure and reflect these financial instruments. Lacking one unified rule to apply to all instruments, standards for financial instruments are often found rules-

based with plenty of exceptions.[1] Although these rules allow certain flexibility for managers in preparing financial statements and in avoiding unnecessary earnings volatility, incoherent accounting treatments and deficiencies in fair value measurement under illiquid market condition increase the difficulty of valuing financial instruments to the users. Investors find it difficult to understand, apply, and interpret the numbers reported on financial reporting (IASB 2008).

As both the IASB and the FASB believe that it is unlikely to come out with a comprehensive solution to accounting measurement on financial instruments in the near future (IASB 2008), disclosures on financial instruments remain the practical way to tackle the ongoing issues. Disclosure can supplement the existing insufficiencies of accounting measurement by providing additional information through footnotes, but, in reality, questions and concerns about these disclosures continue to be brought up. Theoretical works suggest that footnote disclosure may fail to fulfill its goal for both rational and psychological reasons, including but not limited to: (1) the information from disclosure takes more time and effort to process (Barth et al. 2003); (2) disclosure may not successfully deliver the information to investors due to their limited attention (Hirshleifer and Teoh 2003); and (3) ambiguity-averse investors prefer aggregate information in spite of having access to disaggregate information and sense that the aggregate is not a sufficient statistic for the component (Caskey 2009). Furthermore, even before recent financial crises unfolded, some constituents had already voiced concerns about the disclosure practices not providing adequate information on the effects that financial instruments can have

[1] Under SFAS 133 all financial instruments are measured at fair value, the consistent measurement suggesting that supposedly a principles-based standard was promulgated by the FASB; however, the standard may still be viewed as rules-based. The reasons behind that are mainly "scope exceptions and alternative treatments often provided by the [FASB] to meet constituent concerns or … to avoid a conflict with a large and established body of standards … to reduce income volatility or to achieve specific accounting outcome for a specified class of arrangements" (Schipper 2003). To fulfill these purposes, rules are used to describe exceptions and treatments, thus increasing the complexity of the standard.

on an entity's financial position, financial performance, and cash flows (FASB 2008). Thus financial instruments disclosure still leaves room to be desired and may not be a panacea to cure the accounting insufficiencies caused by the unsatisfactory measurement applied to these instruments.

Among financial instruments, derivatives are considered relatively innovative and complex. High leverage and great variation of outcomes are the typical characteristics of derivative instruments. With the aid of financial engineering, these instruments are designed to meet financial needs with their various attributes and payoffs. The valuation of derivatives requires deep financial knowledge and the use of derivatives tends to be perceived as an unorthodox practice which draws attention and scrutiny. In the U.S., accounting information for derivative instruments began with the issuance of SFAS 105 and later was required under SFAS 107 and 119. At this phase, firms only disclosed the fair value of financial derivatives in their footnotes. The implementation of SFAS 133, superseded Statement 105 and 119 for derivatives, demanded that firms measure derivatives with fair value and recognize into their financial performance and financial position, but it also eliminated the need for certain disclosures as, at that time, the FASB believed that the improved accounting requirements would satisfy users' information needs (FASB 2008). After Statement 133's enactment, however, criticism arose for inadequate disclosure on derivative instruments and hedging activities, encouraging the passage of SFAS 161 in March 2008, which would be effective to the preparers starting with the fiscal year after November 15, 2008. Statement 161 regulates an alternative to the existing disclosure practices on derivatives instruments, while Statement 133 stays effective for accounting

recognition of derivatives activities. The timeline of related applied accounting standards is shown below.[2]

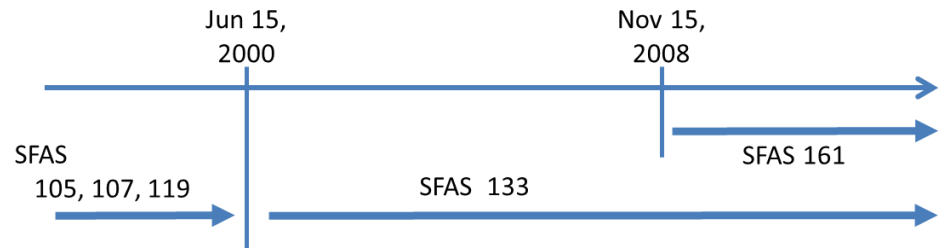

Figure 1.1. Timeline of Statement of Financial Accounting Standard (SFAS) for Derivative Disclosure

This study examines the effects of derivative instruments disclosure, given that the accounting measurement on the instruments remains the same. The main purposes of Statement 161 are to help users of financial statements better understand why an entity uses derivatives in the context of an entity's risk exposures and become better informed of the effects that using derivatives has on an entity's financial position, financial performance, and future cash flows. To determine the most likely impacts from SFAS 161, this study focuses on the banking industry as derivatives instruments are relatively popular among banks. Since banks are experienced with these instruments, it is reasonable to expect related information to be fairly disclosed in

[2] The enactment of SFAS 133 is the watershed to distinguish how firms disclosed their derivatives in the footnotes before SFAS 161. In pre-SFAS 133 era, SFAS 105, 107 and 119 guided the note information about derivatives. At this phase, firms disclosed the fair value of derivatives and began to provide subcategory information since SFAS 119. Most of the disclosure displayed in paragraphs while some firms might supplement the disclosure at their discretion. Since the numbers were not recognized into income or balance sheet (off-balance-sheet items), the connection did not exist between financial statements and their footnotes. In post-SFAS 133 era, the implementation mandated that firms recognized those instruments, superseded prior standards regarding derivatives and simplified disclosure requirements (FASB 2008). The simplification brought up criticism and promoted the setting of SFAS 161 which reinstates certain requirements and introduces tabular formats for note information. Under SFAS 161 firms states why they use derivatives and show their risk exposures in well-arranged format so that readers can map the disclosed information to reported numbers on financial statements. Tables only substitute part of the information previously disclosed in paragraphs. Paragraphs remain used for other information which can't be included in the tables.

comparison with other industries. Bank holdings companies in the sample are those firms continuously involved in the use of derivative instruments since SFAS 133 became effective. In textual analyses, I find that the banks after SFAS 161 use more pages to cover derivative activities in their footnotes and are more likely to report gains and losses from trading derivatives. Further empirical analyses show an increase in the value relevance of trading derivatives and less mispricing following the disclosure change, suggesting that Statement 161 is not merely a boilerplate employed by firms to fulfill regulatory requirement but provides information content to investors.

To shed light on the mechanism behind the value relevance increase after SFAS 161, I analyze its association with firms' investor sophistication to see whether disclosure complexity contributes to the finding of the increased relevance. Complexity could unequally influence investors with different levels of information processing ability; greater complexity widens the gap of understanding between investors as sophisticated investors are expected to be less affected by such complexity. Using institutional ownership and analyst following to proxy firms' investor sophistication, the results suggest that, before SFAS 161, the firms with high investor sophistication had greater value weight on trading derivatives than those with lower sophistication. This is consistent with the prediction that sophisticated investors would be better informed of firms' trading derivatives before less complex disclosure is available. The difference in value relevance narrowed after Statement 161 became effective, indicating that more approachable derivative disclosure leads to a reduction in the divergence of understanding between investors. Further analysis shows that the new standard also benefits the firms with high institutional ownership with the exception of those firms with the highest level. As so, the value

relevance increase is observed among firms with all levels of investor sophistication but to different extents.

This paper evaluated SFAS 161's implementation by analyzing firms' disclosure and assessing its impacts on the value relevance of trading derivatives in the banking industry. I investigated whether changing disclosure practice is relevant to investors' assessment and whether such a change would provide additional information and cause effects on their valuation, even though they have either rational consideration or psychological bias toward disclosure. In the comment letters to the Exposure Draft of SFAS 161, some constituents mentioned that it would be much more useful to improve the presentation of derivatives instruments on financial statements instead of improving disclosure, implying that footnotes may not be the best place for many investors to find relevant information for these items. The empirical results proved that the change is relevant even when the disclosure content covers the instruments with complex features such as derivatives.

This study reveals that investor sophistication is a factor in explaining value relevance difference between firms where disclosure complexity is noticeable. That difference can be reconciled through accounting standard requirements by enhancing the disclosure to reduce the role of sophistication; in other words, standard setting could have various influences on market participants in terms of their sophistication. Also, it suggests that recognition is not always the ultimate solution when the measured item is complex and that disclosure can supplement the information loss in the aggregation process of accounting recognition. Overall, the analyses provided in this study will contribute as a reference for future discussions that, when it comes to financial instruments, in addition to relying on managers to process and present the information

on financial statements, the role of disclosure assists in the fair value accounting for financial reporting users.

The rest of this paper is organized as follows. Background is provided in Chapter 2 and hypotheses are developed throughout the chapter. Chapter 3 details sample selection and reports findings from contextual analysis on firms' derivative disclosure. Empirical models for hypothesis testing are presented in Chapter 4, and empirical results are shown in Chapter 5. The paper concludes in Chapter 6.

CHAPTER 2

BACKGROUND AND HYPOTHESES DEVELOPMENT

This study is hinged on two major concepts: one is information complexity, the other is investor sophistication, defined as the extent of knowledge and capability investors are equipped with for processing information.[3] It examines how these two factors affect investors understanding the information accessible in the capital market. In the financial reporting, firms disclose to stakeholders their usage of financial derivatives, the instruments which are considered so innovative and complex that deep knowledge is required to comprehend these financial activities engaged by companies. Only when users are sophisticated enough or when the information is modified to accommodate their sophistication does the reporting become a channel to deliver information content to them. The phenomenon is expected to be more evident in the banking industry as financial derivatives are used substantially by financial institutions in terms of extent and amount. As so, the disclosure of banks' financial derivatives is the center of the study to examine how investors perceive the information before and after SFAS 161 became effective.

This chapter unfolds with the background regarding the footnote disclosure of banks' financial derivatives and then discusses related value-relevance studies and the role of investor sophistication in the relevance. Research hypotheses are developed throughout the chapter.

[3] In terms of characteristics of financial statement users, the information might be processed differently by the users due to "[the lack of] some combination of problem-solving ability, knowledge, and ability and willingness to process disclosed items thoroughly" (Schipper 2007). The identification of user groups can be established by the difference in the combination.

2.1 Footnote Disclosure of Banks' Financial Derivatives

In the Discussion Paper of 2008, the IASB indicates that diverse accounting methods provide the flexibility desired by the preparers of financial information but these methods are also the primary source of the complexity in reporting financial instruments. Simplifying accounting choices may reduce the complexity but make it more difficult for preparers to report financial instruments as they would prefer. In addition, the benefits from reducing applicable accounting methods are unclear as some practices, such as hedge accounting, will remain counter-intuitive and confusing to many users of financial information regardless of what changes are proposed to those methods. To address the complexity issue, enhancing the disclosure is currently regarded as the favorable way to provide transparent information for the users as well as to maintain the flexibility for the preparers.

Under the circumstances of the reporting complexity, SFAS 161's main purposes are to help the users of financial statements better understand why an entity uses derivatives in the context of an entity's risk exposures and become better informed of the effects that using derivatives has on an entity's financial position, financial performance, and future cash flows. Tabular formats are a major feature of Statement 161 and the FASB believed that disclosure in tables is the best way to convey an overall understanding of firms' derivative activities (FASB 2008). The tabular presentation not only provides well-arranged subcategory information but also organizes derivative information for investors to map the disclosed information to the numbers of related components on financial statements. Accordingly, SFAS 161 would impact the existing derivative disclosure practice by altering the presentation in the footnotes. Textual

analyses are conducted in the study to show the magnitude of the shift in the footnote disclosure regarding financial derivatives for the banking industry.

2.2 Value Relevance of Banks' Trading Derivatives

Value-relevance studies examine whether accounting numbers are related to a firm's value assessed by market participants. These accounting numbers are either only disclosed in footnotes or are already recognized and shown on firms' financial statements. Since recognition requires a rigorous treatment and matters to the bottom-line numbers reported on balance sheet and/or income statement, the FASB inclines to ask firms to disclose related numbers in the footnotes before it officially demands accounting recognition to firms' financial statements. Consequently, prior studies started the investigation of value relevance with the disclosure for a specific accounting standard to see whether the disclosed information was interesting to investors (e.g., Dhaliwal 1986; Barth 1991). After the standard was promulgated for recognition, studies further tested whether the value relevance of recognized numbers were different from the relevance of disclosed numbers (e.g., Aboody 1996; Davis-Friday et al. 1999). Empirical studies showed that, in general, recognition is better than or at least as good as disclosure only (Libby et al. 2006; Schipper 2007), the finding suggesting that the disclosed information is dominated by recognition numbers and bolstering that the FASB simplifies the requirements for related disclosure after accounting recognition.

Accounting for financial instruments has been studied for related value-relevance issues since it could significantly affect the presentation in balance sheet and income statement, both of whose reported numbers would alter investors' perception and change their decision. Prior

literature examined SFAS 107 for financial instruments disclosure (Barth et al. 1996; Eccher et al. 1996; Nelson 1996), SFAS 119 for financial derivatives disclosure (Venkatachalam 1996), and SFAS 133 for financial derivatives recognition (Ahmed et al. 2006). These studies investigated the association between equity prices and fair values reported either from disclosure or from recognition. They show that the reported numbers matter to the market in both disclosure and recognition and support that recognition has a better value relevance than does disclosure. Even though financial derivatives are already recognized into financial statements, the Board acknowledged that, owing to accounting complexity and inadequate disclosure, existing accounting reporting could not satisfy users' need (FASB 2008). The derivative disclosure under SFAS 161 is expected to provide supplemental information to the recognized numbers of these derivative instruments.

The textual analyses suggest that Statement 161 makes firms attentive to their disclosure. For example, JPMorgan Chase & Co. disclosed its derivatives activities in footnote 32, the second from the bottom, in its Form 10-K for the fiscal year 2008, while such disclosure was put in footnote 5, near the top of the list, for the fiscal year 2009. Its disclosure is covered over 4 pages in 2008 but is added up to 8 pages in 2009, the additional pages relating to the requirements of SFAS 161. Statement 161 provides a guideline for firms to disclose in a way that investors can map the disclosure of derivative instruments to the numbers reported on financial statements, and this mapping is relatively useful for the valuation of derivatives with trading purposes.

Derivative contracts can be held for trading purposes and other than trading purposes.[4] Since derivatives with other than trading purposes are used to hedge fair value of assets or liabilities, related gains and losses under hedge accounting will be cancelled out when fair value changes. When a change occurs, hedging derivatives and hedged items are in relation to each other but in opposite directions until derivative contracts expire. In other words, no impact results from a change and mapping does not provide incremental information to users for hedging derivatives when net assets remain the same. Ahmed et al. (2006) confirmed the relation by showing that investors valued hedging derivatives similarly to other financial assets and liabilities after the enactment of SFAS 133. Therefore, given that Statement 161's aim is to enhance the disclosure under Statement 133 and to improve the transparency by containing more accessible information beyond recognition for investors, it is reasonable to expect that the enactment should increase the value relevance for trading derivatives. As so,

H1: The value relevance of banks' trading derivatives increases after SFAS 161.

2.3 Investor Sophistication and Value Relevance of Banks' Trading Derivatives

As Caskey (2009) states, "ambiguity-averse investors may prefer to view an aggregate signal even when they have access to disaggregate information and know that other investors will view the disaggregate information." In the context of financial reporting, investors would rely on reported numbers in recognition (aggregate information) to reduce their exposure to the ambiguity from footnotes (disaggregate information) that results from their inability to interpret

[4] Also known as other than hedging purposes and hedging purposes respectively

the footnote disclosure precisely. Investors view the benefit of ambiguity reduction outweighs the cost of information loss. The point is supported by Ahmed et al. (2006) who investigated the change in the value relevance of banks' financial derivatives after SFAS 133 began to require firms to recognize these derivatives which were disclosed in footnotes previously. They showed that the value relevance of hedging derivatives is greater for recognition than for disclosure, suggesting that investors did not react to disaggregate information as much as to aggregate information.

On the other hand, prior literature reveals that investor sophistication plays a role in value relevance of disclosure. Using a sample of firms with pension liabilities, Yu (2013) found that firms with a high level of institutional ownership or analyst following were associated with significant value relevance of disclosed liabilities but firms with a low level were not, indicating that sophisticated investors use the information from disclosure as much as the information from recognition. A similar inference is made by Michels (2014) who tested the value relevance of subsequent events disclosure due to the natural disaster after balance sheet date; sophisticated investors are more likely to react to the disclosure than are unsophisticated investors. Hence, sophisticated investors are less affected by the ambiguity from disclosure and they reflect the information in equity prices. If disclosure complexity increases interpretation ambiguity and prevents unsophisticated investors from accessing the disclosed derivative information, then the value relevance for the banks with a low sophistication investor clientele should be lower. This leads to the following hypothesis.

H2a: The value relevance of trading derivatives before SFAS 161 is greater for banks with a high sophistication investor clientele than for banks with a low sophistication investor clientele.

While the improved disclosure under SFAS 161 is expected to become more accessible to investors, it is unclear whether the change impacts investor clientele of varying sophistication equally. When firms recognize an off-balance-sheet item previously disclosed in footnotes, it does not change its information content but rather its format. The altered format only affects the group who is unable to understand the existing footnote disclosure. Given the finding that firms with a high level of institutional ownership or analyst following reacted to off-balance-sheet pension liabilities before the requirement of accounting recognition, Yu (2013) showed that increased value relevance after SFAS 158 is primarily found among the firms with a low level of sophisticated investors, suggesting that unsophisticated investors are the only group influenced by Statement 158.

In the context of derivative disclosure, as in the illustration below (Table 2.1), the market is assumed to consist of two types of investors: high sophisticated investors and low sophisticated investors. The capability of handling the complexity of derivative disclosure is used as the factor to differentiate between these investors; the high sophisticated investors can handle the disclosure complexity up to level 3 while the low sophisticated can only handle up to level 1. Thus, when the disclosure, D1, requires a capability of level 2 before SFAS 161, the high sophisticated investors get the message but the low sophisticated investors do not.

Table 2.1. Analysis of Investors Capability and Disclosure Complexity around SFAS 161

	High Sophisticated Investors	Low Sophisticated Investors
Capability Level	3	1
Pre-SFAS 161		
D1: Complexity Level=2	Y	N
Post-SFAS 161		
D1: Complexity Level=1	Y	Y
Benefit from SFAS 161?	No	Yes

Note: D1 refers to derivative disclosure under the regime; "Y" means that the investors understand the disclosure, while "N" means that they do not.

Later, the complexity of derivative disclosure is reduced to level 1 as a result of the enhanced disclosure required by SFAS 161,[5] so that both types of investors grasp the firm's derivative activities through footnotes. In this scenario, the low sophisticated investors are the group who benefits from the passage of Statement 161, hence, the following hypothesis is proposed.

H2b: The value relevance of trading derivatives increases after SFAS 161 for banks with a low sophistication investor clientele.

Besides, the enhanced derivative disclosure could benefit high sophisticated investors as well. High sophisticated investors may be equipped with the capability to approach the derivative disclosure but the extent to which they are able to do so is questionable. Chang et al. (2016) found that analysts' earnings forecast became less accurate and more dispersed after firms engaged in derivative activities, the deterioration tied to the accounting reporting complexity

[5] Tabular presentation is the major feature brought by SFAS 161. The Board believes that tabular disclosure provides a better link between footnotes and financial statements, thus improving the transparency (FASB 2008). Comparing with paragraphs, tables not only organize the information better but also are more likely to catch readers' attention. These merits would reduce the time and effort to process the information (Barth et al. 2003) and increase the chance for the disclosure to be noticed by users (Hirshleifer and Teoh 2003). Since fewer limitations are faced by investors after SFAS 161, the accessibility of derivative disclosure is enhanced.

since SFAS 133's enactment. Their study showed that sophisticated market participants like financial analysts misjudged the earnings implications of firms' derivative activities under the existing accounting practice and that further amendments to the standard could improve the situation.

Firms disclose a variety of derivative information under SFAS 133; some are less complex while some are more so, meaning that not all information is necessarily well received by high sophisticated investors. Extended from the previous illustration (Table 2.1), the one below (Table 2.2) assumes that the derivative disclosure consists of two components instead, D1 and D2; D1 (level 2) is less complex than D2 (level 4) before SFAS 161. In this setting, the high sophisticated investors get the message from D1 but not from D2, while the low sophisticated counterparts know nothing from both components of the disclosure prior to Statement 161. In the post-SFAS 161 era, the complexity of both components decreases by 1 level equally, so that the high sophisticated investors understand the value implication from both components, while the low sophisticated investors start to become informed from D1. As such, both types of investors benefit from the change but to different extent.

Table 2.2. Extended Analysis of Investors Capability and Disclosure Complexity around SFAS 161

	High Sophisticated Investors	Low Sophisticated Investors
Capability Level	3	1
Pre-SFAS 161		
D1: Complexity Level=2	Y	N
D2: Complexity Level=4	N	N
Post-SFAS 161		
D1: Complexity Level=1	Y	Y
D2: Complexity Level=3	Y	N
Benefit from SFAS 161?	Yes	Yes

Note: D1 (D2) refers to component 1 (component 2) of derivative disclosure under the regime; "Y" means that the investors understand the disclosure, while "N" means that they do not.

If Statement 161 makes the disclosure more transparent, then the information which confused high sophisticated investors before would become useful to them instead, resulting in higher value relevance. That is,

H2c: The value relevance of trading derivatives increases after SFAS 161 for banks with a high sophistication investor clientele.

CHAPTER 3

SAMPLE SELECTION AND TEXTUAL ANALYSES

This chapter first describes the procedure to select the sample for hypothesis testing, and details the sources for data collection. Since the footnote disclosures of banks' financial derivatives under SFAS 133 is the core to examine the relations identified in this study, it is important to look into firms' 10-K for these disclosures and summarize the findings from textual analyses. These analyses provide direct evidence regarding the disclosure practice in the post-SFAS 133 period and the change caused by SFAS 161.

3.1 Sample Selection and Data

This study focuses on the banking industry as derivative instruments are relatively popular among banks. In addition, banks are experienced with these instruments so that the related information is likely to be fairly disclosed. My analyses are restricted to those banks with derivatives activities during the fiscal year.

My sample consists of the U.S. bank holding companies which used derivatives from 2001 to 2014 and had price data on CRSP. The sample starts from 2001 because SFAS 133 became effective for the fiscal year beginning after June 15, 2000 and this paper aims at analyzing the post-SFAS 133 periods. To mitigate other factors confounding inference,[6] the analysis is restricted to those banks with continuous engagement in derivatives during 2001-

[6] Prior studies (e.g., Tufano 1996; Geczy et al. 1997; Guay and Kothari 2003) suggest that economic consideration may contribute to the usage of derivatives. Frequent users and sporadic users of derivatives are likely systematically different (Barton 2001; Pincus and Rajgopal 2002) and the difference could confound inference (Kilic et al. 2013).

2012. Then the selected firms are merged with their data of financial information, stock market value and investor sophistication (institutional ownership and analyst following are employed as the proxy in this study). The process yields a final sample of 51 bank holding companies and 711 firm-year observations.

Research data are from multiple sources. Banks' fair value of derivative instruments and related financial statement items are collected from the Bank Regulatory Database. Institutional ownership, analyst following and market value are from Thomson Reuters 13F Institutions (formerly known as CDA/Spectrum S34), I/B/E/S and CRSP respectively. Derivative disclosure order, number of pages, and trading derivative gains and losses are gathered from firms' 10-K. Audit-related data are from the Audit Analytics database.

3.2. Textual Analyses

3.2.1 Disclosure Order and Number of Pages

To understand the magnitude that SFAS 161 has changed accounting disclosure on derivatives instruments, I look into the sample firms' derivative disclosure in their 10-Ks for the fiscal year 2008 and 2009. 2008 is the last year before the enactment of SFAS 161 while 2009 is the first year after. The analysis can shed light on how the new standard impacts firms' derivative disclosure practice and how firms' disclosure changed. Specifically, I analyze the location and number of pages used for each firm's derivative-related information section. It is reasonable to assume that firms place more important information front in their footnotes. Also, more pages are needed if firms attempt to elaborate more details of the disclosure. Table 3.1 Panel A and Panel B show the distribution of the order and the number of pages respectively.

Table 3.1 Panel A reveals that, comparing with the fiscal year 2008, most of the firms in the fiscal year 2009 remained putting the related information in the order 11^{th}-15^{th} or 16^{th}-20^{th} in their footnotes, but some firms moved up their disclosure in their footnotes while some firms no longer disclosed in a separate section. On the other hand, Panel B indicates that most of the firms disclosed in 3 to 4 pages (4 to 5 pages) for derivative instruments for the fiscal year 2008 (2009). The average number of pages increased from 2.86 to 3.84, suggesting that firms disclosed differently after the enactment of SFAS 161. Further, Panel C shows the change in the order and the pages in individual firm level. The panel shows that 6 (5) out of 51 firms moved up (down) the disclosure and that 32 (7) out of 51 firms increased (decreased) the number of pages to report their derivatives in the footnotes. Based on Wilcoxon signed-rank tests, the results suggest that the change in the order was neither industry-wide nor in a specific direction, while the increase in the pages was common in the banking industry.

Table 3.1. Footnote Disclosure of Financial Derivatives around SFAS 161 Enactment
--Order and Pages

Panel A: Order Number

Order number	Fiscal year	
	2008	2009
1-10	4	6
11-15	11	11
16-20	22	17
21-25	5	9
26-30	5	2
30+	2	2
No separate section	2	4
Number of firms	51	51

Panel B: Number of Pages

Number of pages	Fiscal year	
	2008	2009

5+	2	9
5	3	12
4	10	10
3	18	6
2	8	6
1	8	4
0	2	4
Number of firms	51	51
Average pages	2.86	3.84

Panel C: Comparison around SFAS 161 Enactment

From 2008 to 2009	Order	Pages
up/ increase	6	32
no change	40	12
down/ decrease	5	7
Number of firms	51	51
Wilcoxon signed-rank test		
z-statistics	0.249	4.304
(p-value)	(0.804)	(0.000)

Note: Table 3.1 shows the distribution of the sample in terms of the order for derivative disclosure in the firm's 10-K footnotes (Panel A) and the number of pages used for the disclosure (Panel B). Year 2008 is the last year before SFAS 161 while year 2009 is the first year after SFAS 161. Each firm's disclosure in the year of 2008 or 2009 is identified to one of categories for the order and number of pages. The order in the category 1-10 means that readers find the disclosure in the first 10 footnotes; in contrast, the category 30+ means that the disclosure is outside the top 30 and close to the bottom of the footnotes. No separate section means that the firm does not disclose derivative information in a separate section, indicating that it may be briefly mentioned in a section of other item or it does not disclose at all. For the number of pages, the category 5+ means that the firm uses more than 5 pages to describe its financial derivatives. On the other hand, if the firm does not report these instruments in a separate section, then the number is zero. The comparison (Panel C) shows the change across the periods for each individual firm. The order is up (down) if the order in 2009 moves closer to the top (bottom) than in 2008; for example, the order is up when J.P. Morgan Chase & Co. moves the disclosure from footnote 32 in 2008 to footnote 5 in 2009. The pages increase (decrease) if a firm uses more (fewer) pages to disclose in its footnote for 2009 than for 2008. Wilcoxon signed-rank test is to show whether the sample firm has the same footnote order or number of pages in two immediate years; the difference is significant when the absolute value of z-statistics (p-value) is larger (smaller).

3.2.2 Disclosure of Trading Derivative Gains and Losses

In addition to the outward appearance, analyzing the contents of the disclosure is another way to see how SFAS 161 has changed the practice. As one of the Statement goals is to help investors map the disclosure to the reported numbers on financial statements, I search for the disclosed accounting number which is included in the bottom line of financial statements but not

reported separately on the statements. The item I identified is trading derivatives gains and losses. Trading gains and losses from derivatives are prevalent among banks because they help their clients to shield off the risks by being the transaction counterparty of derivative contracts. Banks bear the residual risk from imperfect hedging, or they take the whole risk from the clients if no hedge is taken. Trading derivatives gains and losses reflect the results of risk management through derivative instruments under SFAS 133 and it provides a good reference to banks' derivatives activities.

Table 3.2 describes that the majority of the sample did not have trading derivative gains and losses in their footnotes of the year 2008, but more than half of these firms disclosed the numbers in the year 2009. The chi-square test proves that the change is significant in the immediate years around SFAS 161. Over the sample years, Figure 3.1 shows that, before SFAS 161, it is common to find fewer than 20 percent of the firms disclosed trading derivative gains and losses in their footnotes, while most of the firms disclosed such information after the enactment of Statement 161, suggesting the change is permanent and is motivated by the new accounting standard.

Table 3.2. Footnote Disclosure of Financial Derivatives around SFAS 161 Enactment
--Trading Derivative Gains and Losses

Trading derivative gains and losses disclosed	Fiscal year			
	2008		2009	
	N	Percentage	N	Percentage
Yes	12	24%	40	78%
No	39	76%	11	22%
Number of firms	51		51	
Chi-squared (p-value)	30.757	(0.000)		

Note: Table 3.2 shows the number (N) and the percentage of firms who disclose or not trading derivative gains and losses in a specific year. Year 2008 is the last year before SFAS 161 while year 2009 is the first year after SFAS 161. Chi-squared is estimated from chi-square test on whether the distribution is the same between two immediate years, and corresponding p-value is shown in parenthesis; the difference is significant when chi-squared statistics (p-value) is larger (smaller).

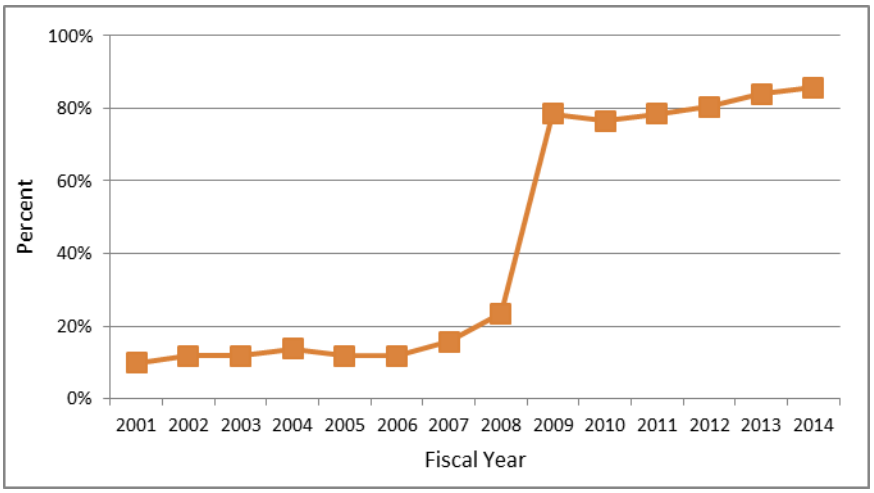

Figure 3.1. Percentage of Trading Derivative Gains and Losses Disclosed in Footnotes

Note: Figure 3.1 shows the percentage of the sample with the disclosure of trading derivative gains and losses in the footnotes over years 2001-2014; pre-SFAS 161: 2001-2008; post-SFAS 161: 2009-2014.

To see whether auditors play a role in the increase and the difference in the disclosure of trading derivatives gains and losses, Figure 3.2 displays the results in terms of accounting firms. Since SFAS 133 became effective, KPMG and Ernst & Young (EY) are the two major accounting firms auditing my sample firms, and only less than 10 percent of the sample is audited by non-big accounting firms.[7] On the whole, Figure 3.2 mirrors the pattern exhibited in Figure 3.1, regardless of the firms audited by big or non-big accounting firms, or by KPMG or EY. The analyses suggest that firms primarily decide what to be covered in the derivatives disclosure.

[7] The untabulated analyses suggest that non-big accounting firms audited fewer than 10 percent of the public banks with derivatives activities in terms of total assets or audit fees share, a common phenomenon in the banking industry.

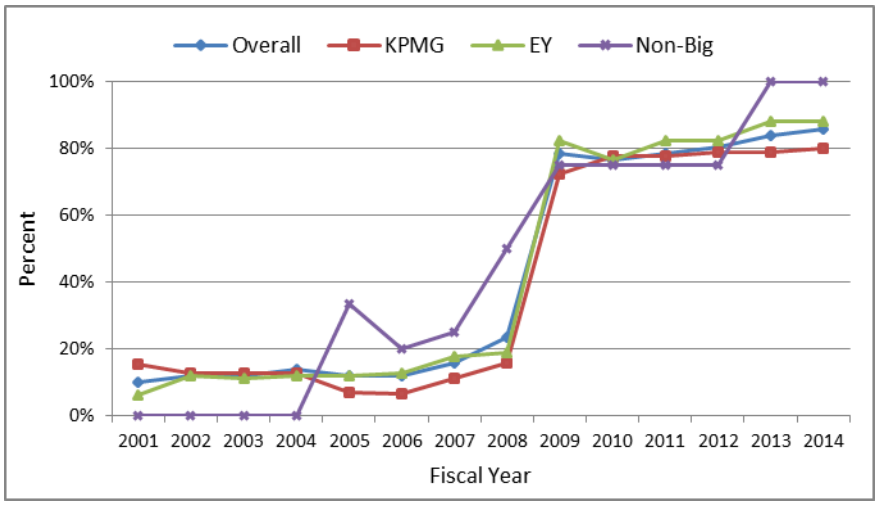

Figure 3.2. Auditors and Percentage of Trading Derivative Gains and Losses Disclosed in Footnotes

Note: Figure 3.2 shows the percentage of the sample disclosing trading derivative gains and losses in the footnotes over years 2001-2014; pre-SFAS 161: 2001-2008; post-SFAS 161:2009-2014. KPMG (EY, or Non-Big) refers to the firm audited by KPMG (Ernst & Young, or non-big accounting firm). Non-Big accounting firm is the auditor not affiliated with KPMG, Ernst & Young, PricewaterhouseCoopers (PwC), Deloitte & Touche, or Arthur Andersen.

In sum, textual analyses show the magnitude of the shift in the banks' derivative disclosure. Overall results conclude that SFAS 161 has changed banks' derivative disclosure in both display and contents. By examining the association between the disclosure and equity prices, further empirical analyses reveal how market participants perceive and react to these disclosures.

CHAPTER 4

EMPIRICAL MODEL

To test the research hypotheses, this study utilizes archival data and regression models to provide evidence for assessments. This chapter starts with prior literature to understand the models for related studies, and further describes how the models are employed and modified to conduct analysis on collected data.

4.1 Value Relevance of Trading Derivatives

Prior literature (Ahmed and Takeda 1995; Venkatachalam 1996; Ahmed et al. 2006) shows that a bank's equity value (MVE) is a function of its assets (MVA), liabilities (MVL) and net value of off-balance-sheet items (NOBS). In the banking industry, assets can break down into financial assets (FA) and nonfinancial assets (NFA) while liabilities into financial liabilities (FL) and nonfinancial liabilities (NFL), as the equation is shown below.

$$MVE_t = MVA_t - MVL_t + NOBS_t$$

$$MVE_t = FA_t + NFA_t - FL_t - NFL_t + NOBS_t$$

Derivative contracts can be held for trading purposes and other than trading purposes.[8] Regardless of the purposes, firms under SFAS 133 are required to recognize fair value of derivatives instruments into their financial assets or financial liabilities depending on whether it is a claim or an obligation. As so, financial assets (FA) can split into non-derivative (FAX) and

[8] As known as other than hedging purposes and hedging purposes

derivative assets (DER_A) while financial liabilities (FL) into non-derivative (FLX) and derivative liabilities (DER_L). Thus, the equation can further extend to

$$MVE_t = FAX_t + DER\_A_t + NFA_t - FLX_t - DER\_L_t - NFL_t + NOBS_t$$

To avoid the inflation of reported assets and liabilities, firms are allowed to report the net effects of derivatives instruments on their balance sheet when derivative instruments are subject to master netting arrangements and qualified for net presentation under FIN 39, so DER represents the net value of DER_A and DER_L. The equation is reorganized as follows.

$$MVE_t = FAX_t - FLX_t + NFA_t - NFL_t + NOBS_t + DER_t$$

Based on the equation above, the regression model is developed as Eq. (4.1) to test the association between firm's market value and reported assets/liabilities. Derivatives with trading purposes are the center of this study.[9] All variables are deflated by the number of outstanding shares of common stock at the fiscal year-end to mitigate potential scale effects (Barth and Clinch 2009). Following Ahmed et al. (2006) and Barth et al. (1996), the regression also includes nonperforming loans (NPL) to control bank's default risk and core deposits (CORE), defined as domestic deposits minus time deposits, to proxy the significant intangible values attached to the bank. As footnote disclosure is available after 10-K is released, market value at three months after fiscal year-end is used in the estimation. I estimate the model separately for the periods before and after SFAS 161. The coefficient on derivatives instruments, α_7, expects to be positive,

[9] Since derivatives with other than trading purposes are used to hedge fair value of assets and liabilities, related gains and losses under hedge accounting will be cancelled out when fair value changes. The value relevance of derivatives with other than trading purposes expects to be the same as the hedged components on balance sheet but in opposite directions. A similar analysis will be conducted as an additional test for derivatives with other than trading purposes.

and the difference of α_7 from two periods indicates whether the value relevance of reported trading derivatives increases after SFAS 161.[10]

$$MVE_{it} = \alpha_0 + \sum_{t=1}^{T-1} \alpha_{01,t} Y_t + \sum_{i=1}^{K-1} \alpha_{02,p} BHC_i + \alpha_1 FVFA_{it} + \alpha_2 FVFL_{it} + \alpha_3 NFA_{it} + \alpha_4 NFL_{it} + \alpha_5 NPL_{it} + \alpha_6 CORE_{it} + \alpha_7 DER_{it} + \varepsilon_{it} \quad (4.1)$$

To see whether firms' investor sophistication is associated with the value relevance of derivative instrument, the model further includes a quintile rank variable (Q_SO) to proxy the sophistication, based on annual quintile rank of the percentage of institutional ownership or the number of analyst following.[11] The variable is scaled to range from 0 to 1. I expect λ_8 to be positive if firms with high investor sophistication have greater value relevance than their lower counterparts before SFAS 161. The difference of λ_8 across two periods indicates whether the firms with high investor sophistication increase their value relevance for trading derivatives after the new standard.[12] The model is shown as Eq. (4.2).

$$MVE_{it} = \lambda_0 + \sum_{t=1}^{T-1} \lambda_{01,t} Y_t + \sum_{i=1}^{K-1} \lambda_{02,p} BHC_i + \lambda_1 FVFA_{it} + \lambda_2 FVFL_{it} + \lambda_3 NFA_{it} + \lambda_4 NFL_i + \lambda_5 NPL_{it} + \lambda_6 CORE_{it} + \lambda_7 DER_{it} + \lambda_8 Q\_SO * DER_{it} + \lambda_9 Q\_SO + \varepsilon_{it} \quad (4.2)$$

[10] Analysis is also conducted by adding post-dummy with all variables in Eq. (4.1) to show the difference of α_7.

[11] Hand (1990) used institutional ownership to indicate the portion of a firm's stock held by sophisticated investors, and Walther (1997) proved that investor sophistication was associated with both the percentage of institutional ownership and the number of analyst following, the proxies commonly used in the related literature since then.

[12] The analysis is conducted by adding post-dummy with all variables in Eq. (4.2) to see the difference for both λ_7 and λ_8. After that, value relevance for sophistication quintile is shown according to the marginal effect of the coefficients from Eq.(4.2), and the delta-method (Oehler 1992) is used to estimate the standard errors for determining the significance.

4.2 Incremental Value Relevance of Subcategory Information

Tabular formats to organize related information are regarded as a major feature of SFAS 161, whose goal is to provide subcategory information and to map the disclosed information to the numbers of related components on financial statements. The tables arrange detail information according to purposes, types of risks and instruments. In addition to the purposes, market assessments toward derivative instruments could be significantly different under various risk exposures. The subcategory information helps readers to have a better sense of the extent and what risk exposure the banks face currently. Such information disclosure was first introduced in SFAS 119 but is presented in tabular formats under SFAS 161.

Derivative contracts can be categorized into four types based on the risk commonly identified in the underlying assets and liabilities: interest rate (DER_I), foreign exchange (DER_F), equity derivative (DER_E), and commodity and others (DER_C).[13] Since underlying assets and liabilities' value changes with the movement of identified risks, derivatives across types share less in common for valuation. If footnote disclosure provides supplement information to the recognition and is used by investors, then it is reasonable to expect that the model fitness would be better with such information. The variable DER in both Eq. (4.3a) and Eq. (4.3b) represents total net fair value of trading derivatives. The variable DER_I, DER_F, DER_E, and DER_C in Eq. (4.3b) are part of DER before netting. When the coefficients $\beta_7 = \beta_{7,1} = \beta_{7,2} = \beta_{7,3} =$

[13] Credit risk is another risk covered in the disclosure but is not included in the model due to data limitation.

$\beta_{7,4}$, Eq. (4.3b) will not provide incremental explaining power to Eq. (4.3a). The significant difference shows the information content added by the subcategory disclosure.[14]

$$MVE_{it} = \beta_0 + \sum_{t=1}^{T-1} \beta_{01,t}\, Y_t + \sum_{i=1}^{K-1} \beta_{02,p}\, BHC_i + \beta_1 FVFA_{it} + \beta_2 FVFL_{it} + \beta_3 NFA_{it} + \beta_4 NFL_{it} + \beta_5 NPL_{it} + \beta_6 CORE_{it} + \beta_7 DER_{it} + \varepsilon_{it} \quad (4.3a)$$

$$MVE_{it} = \beta_0 + \sum_{t=1}^{T-1} \beta_{01,t}\, Y_t + \sum_{i=1}^{K-1} \beta_{02,p}\, BHC_i + \beta_1 FVFA_{it} + \beta_2 FVFL_{it} + \beta_3 NFA_{it} + \beta_4 NFL_{it} + \beta_5 NPL_{it} + \beta_6 CORE_{it} + \beta_7 DER_{it} + \beta_{7,1} DER\_I_{it} + \beta_{7,2} DER\_F_{it} + \beta_{7,3} DER\_E_{it} + \beta_{7,4} DER\_C_{it} + \varepsilon_{it} \quad (4.3b)$$

To examine whether investor sophistication affects the incremental value relevance from subcategory information, Eq. (4.3c) includes interaction terms with a dummy variable of institutional ownership or analyst following (D_SO), which indicates whether it is above or below the annual median. The F test on these interaction terms indicates whether the difference exists in pre-SFAS 161 and post-SFAS 161 periods respectively.

$$MVE_{it} = \beta_0 + \sum_{t=1}^{T-1} \beta_{01,t}\, Y_t + \sum_{i=1}^{K-1} \beta_{02,p}\, BHC_i + \beta_1 FVFA_{it} + \beta_2 FVFL_{it} + \beta_3 NFA_{it} + \beta_4 NFL_{i} + \beta_5 NPL_{it} + \beta_6 CORE_{it} + \beta_7 DER_{it} + \beta_{7,1} DER\_I_{it} + \beta_{7,2} DER\_F_{it} + \beta_{7,3} DER\_E_{it} + \beta_{7,4} DER\_C_{it} + \beta_8 D\_SO * DER_{it} + \beta_{8,1} D\_SO * DER\_I_{it} + \beta_{8,2} D\_SO * DER\_F_{it} + \beta_{8,3} D\_SO * DER\_E_{it} + \beta_{8,4} D\_SO * DER\_C_{it} + \beta_9 D\_SO + \varepsilon_{it} \quad (4.3c)$$

[14] Adjusted R^2 is the measure, and the likelihood ratio test is used to do the comparison as the two models are nested. In addition, F-test is conducted for the variables from subcategory disclosure.

CHAPTER 5

EMPIRICAL RESULTS

5.1 Descriptive Statistics

Table 5.1 shows summary statistics for related variables. Comparing with Ahmed et al. (2006) whose sample descriptive statistics covering from 1995 to 2000, my sample on average has a larger reported value for the variables. The difference could contribute to (1) more restrictive sample selection leading to the firms with larger assets and liabilities in the sample and (2) the growth of firms' assets and liabilities over time which results from the merger and acquisition in the banking industry.

Table 5.1. Summary Statistics

Variable	Number of Obs.	Mean	Standard Deviation	5th percent	25th Percent	Median	75th Percent	95th percent
FVFA	711	134,944,074	365,528,080	1,630,561	6,371,374	15,088,196	73,356,816	1,091,622,912
FVFL	711	129,080,433	346,899,868	1,354,050	5,618,089	14,367,628	70,184,944	1,082,507,008
NFA	711	17,773,455	49,244,938	103,440	517,740	1,523,928	7,007,131	147,171,968
NFL	711	9,097,233	31,453,252	16,570	93,526	293,094	2,058,718	50,303,692
NPL	711	2,376,316	8,731,797	2,685	29,053	111,795	611,802	9,644,000
CORE	711	54,108,171	144,057,816	458,651	2,528,956	8,621,497	34,551,164	269,375,008
DER	711	429,744	3,478,238	-70,751	0	0	4,344	1,974,000
ABS_DER	711	762,056	3,420,750	0	0	300	27,361	5,446,000
DER_A	711	4,136,746	15,607,529	0	0	11,661	398,614	36,818,988
DER_L	711	3,707,002	14,231,707	0	0	9,987	365,341	24,237,308
INSTOWN	711	0.52	0.21	0.12	0.39	0.55	0.67	0.81
NUMEST	711	11.32	7.82	1	5	10	17	26

The sample includes the observations during 2001-2014. All variables except INSTOWN and NUMEST are in thousand dollars. FVFA: aggregate fair value of financial assets excluding trading derivatives; FVFL: aggregate fair value of financial liabilities excluding trading derivatives; NFA: aggregate book value of nonfinancial assets; NFL: aggregate book value of nonfinancial liabilities; NPL: nonperforming loans; CORE: domestic deposits minus time deposits; DER: net fair value of trading derivative instruments; ABS_DER: absolute net fair value of trading derivative instruments; DER_A: fair value of trading derivative instruments reported as financial assets; DER_L: fair value of trading derivative instruments reported as financial liabilities; INSTOWN: the percentage of institutional ownership; NUMEST: the number of analyst following.

In the same table, net fair value of trading derivative suggests that firms had gains in these activities on average, more firms reported with a gain than those with a loss, and some of the firms closed their position of these instruments before fiscal year-end even though there were activities reported during the year. Since the value of derivative instruments on balance sheet is measured at the difference between fair value and contractual price, the scale of the amount is relatively smaller than the amount of financial assets or financial liabilities, both of which are measured at original cost or the whole fair value.

The sample banks on average had 52 percent of institutional ownership and 11.32 analysts following the firm, higher than the average of the public firms with derivative activities in the banking industry during 2001-2014.[15] The survival bias may contribute to the difference. In terms of standard deviation, the institutional ownership and analyst following for the sample are 21 percent and 7.82 analysts respectively, comparable to all public banks with derivative activities during the same period.[16] The statistics show that the sample has sufficient variance for analyses. However, restrictive sample selection leads to the limitation of generalizing the analysis results.

Table 5.2 shows the correlation among the variables for value-relevance analyses. A high correlation between financial assets and financial liabilities reflects the high-leveraged characteristics of the banking industry. The definition of core deposit derives from the deposits so that it is highly correlated with financial assets and financial liabilities. The correlation of trading derivatives with other variables from balance sheet is mild, thus the econometrics issue is

[15] 40 percent and 6.05 analysts respectively for the public firms in the banking industry

[16] 24 percent and 6.61 analysts respectively for the public firms in the banking industry

less of a concern. The low correlation between trading derivatives and institutional ownership or analyst following suggests that there is no clear relation between the participation of sophisticated investors and the amount of trading derivatives gains and losses, so the analysis is less subject to the concern of self-selection.

Table 5.2. Correlation Analysis

	MVE	FVFA	FVFL	NFA	NFL	NPL	CORE	DER	INSTOWN	NUMEST
MVE	1.0000									
FVFA	0.6024	1.0000								
FVFL	0.5864	0.9978	1.0000							
NFA	0.4716	0.7927	0.8107	1.0000						
NFL	0.3072	0.5769	0.5628	0.6824	1.0000					
NPL	0.0302	0.4342	0.4480	0.5723	0.2866	1.0000				
CORE	0.5829	0.8122	0.8115	0.6058	0.2214	0.4141	1.0000			
DER	0.0697	0.2366	0.2497	0.2884	0.2948	0.2007	0.1113	1.0000		
INSTOWN	0.1817	0.3094	0.3130	0.3797	0.2691	0.3079	0.3201	0.1011	1.0000	
NUMEST	0.2934	0.2307	0.2278	0.3774	0.3926	0.2026	0.2682	0.2109	0.4439	1.0000

The sample includes the observations during 2001-2014. All variables except INSTOWN and NUMEST are deflated by the number of shares outstanding at the fiscal-year end. MVE: equity market value at three months after fiscal year-end; FVFA: aggregate fair value of financial assets excluding trading derivatives; FVFL: aggregate fair value of financial liabilities excluding trading derivatives; NFA: aggregate book value of nonfinancial assets; NFL: aggregate book value of nonfinancial liabilities; NPL: nonperforming loans; CORE: domestic deposits minus time deposits; DER: net fair value of derivative instruments; INSTOWN: the percentage of institutional ownership; NUMEST: the number of analyst following.

Institutional ownership and analyst following are correlated but not completely overlapped. Both institutional investors and analysts are considered as sophisticated market participants, and the discrepancy of the sample helps to confirm whether they interpret derivative information differently.

5.2 Value Relevance of Trading Derivatives

Table 5.3 Panel A reports the value relevance before and after SFAS 161. The coefficient on trading derivatives is significant regardless of pre-SFAS 161 or post-SFAS 161, suggesting that market participants on average value such item with positive and higher than reported book value. Panel B lends support for H1 that the value relevance increases after SFAS 161 though it is significant at a marginal level. As the accounting recognition under SFAS 133 for these derivatives remains the same, the increase could contribute to more accessible disclosure and to firms' dedication under the guideline provided by Statement 161.

Table 5.3 also reveals that the relevance of trading derivatives before SFAS 161 is positively associated with the level of institutional ownership or analyst following. The analyses divided the firms into quintiles according to their percentage of institutional ownership or number of analyst following; the higher percentage of institutional ownership or number of analyst following, the higher quintile the firm is in. Panel C shows that the significantly positive value weight on trading derivatives is found among the firms in the 4^{th} and top quintile of institutional ownership or analyst following. On the other hand, investors tend to be valued zero or negatively for trading derivatives among the firms in the low quintiles of investor sophistication. As hypothesized in H2a, trading derivative are much value relevant to those firms in the high quintile of institutional ownership or analyst following. The finding supports the hypothesis that the value relevance of trading derivatives before SFAS 161 is greater for the firms with a high sophistication investor clientele than the firms with a low sophistication clientele.

Table 5.3. Value Relevance of Trading Derivatives
Panel A: Value Relevance before and after SFAS 161

	Predicted Sign	Pre-SFAS 161 Period			Post-SFAS 161 Period		
		Eq.(4.1)	Eq.(4.2)	Eq.(4.2)	Eq.(4.1)	Eq.(4.2)	Eq.(4.2)
FVFA	+	0.964**	1.029**	0.994**	1.083***	1.095***	1.085***
		(0.391)	(0.418)	(0.405)	(0.265)	(0.267)	(0.266)
FVFL	-	-0.953**	-1.028**	-0.987**	-1.159***	-1.172***	-1.161***
		(0.416)	(0.447)	(0.431)	(0.299)	(0.302)	(0.300)
NFA	+	0.575*	0.630*	0.609*	1.145***	1.157***	1.156***
		(0.306)	(0.322)	(0.318)	(0.336)	(0.345)	(0.344)
NFL	-	-0.473	-0.485	-0.529	-1.135***	-1.129***	-1.135***
		(0.401)	(0.402)	(0.413)	(0.319)	(0.324)	(0.323)
NPL	-	-5.158***	-5.101***	-5.214***	-0.678***	-0.674***	-0.688***
		(0.819)	(0.833)	(0.841)	(0.231)	(0.229)	(0.238)
CORE	+	0.079	0.080	0.079	0.118***	0.117***	0.115***
		(0.069)	(0.067)	(0.069)	(0.031)	(0.031)	(0.031)
DER	**+**	**1.911****	**-0.785**	**-0.596**	**3.460*****	**2.349***	**2.509**
		(0.814)	**(1.832)**	**(4.127)**	**(0.716)**	**(1.728)**	**(3.343)**
DER*Q_INSTOWN	**+**		**3.678***			**1.599**	
			(2.770)			**(2.039)**	
DER*Q_NUMEST	**+**			**2.772**			**1.102**
				(4.508)			**(4.109)**
Q_INSTOWN	?		-1.936			-0.923	
			(4.191)			(2.188)	
Q_NUMEST	?			-4.069			1.758
				(4.099)			(2.353)
Year Effect		Yes	Yes	Yes	Yes	Yes	Yes
Firm Effect		Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2		0.818	0.819	0.818	0.963	0.963	0.963
Observations		408	408	408	303	303	303

Regression analysis is based on Eq.(4.1) or Eq.(4.2), where Q_SO is replaced with Q_INSTOWN or Q_NUMEST in the analyses here. All variables except Q_INSTOWN and Q_NUMEST are deflated by the number of shares outstanding at the fiscal-year end. The sample includes the observations during 2001-2014. The analyses are estimated separately for the Pre-SFAS 161 period (2001-2008) and the Post-SFAS 161 period (2009-2014). The dependent variable is equity market value at 3 months after fiscal year-end; FVFA: aggregate fair value of financial assets excluding trading derivatives; FVFL: aggregate fair value of financial liabilities excluding trading derivatives; NFA: aggregate book value of nonfinancial assets; NFL: aggregate book value of nonfinancial liabilities; NPL: nonperforming loans; CORE: domestic deposits minus time deposits; DER: net fair value of trading derivative instruments; Q_INSTOWN: the quintile ranks of the percentage of institutional ownership scaled to be between 0 and 1; Q_NUMEST: the quintile ranks of the number of analyst following scaled to be between 0 and 1. The standard errors are clustered by firm and shown in the parentheses.*** p<0.01, ** p<0.05, * p<0.1 is based on one-tailed t-tests when the coefficient sign is predicted, and based on two-tailed t-tests otherwise.

Panel B: Value Relevance across SFAS 161 Enactment

	Predicted Sign	Eq.(4.1)	Eq.(4.2) Institutional Ownership	Eq.(4.2) Analysts Following
DER	+	1.911**	-0.785	-0.596
		(0.814)	(1.827)	(4.115)

DER*Q_SO	+		3.678*	2.772
			(2.762)	(4.495)
DER*POST	+	1.549*	3.134	3.106
		(1.079)	(2.507)	(5.289)
DER*Q_SO*POST	?		-2.080	-1.670
			(3.426)	(6.074)
Control Variable		Yes	Yes	Yes
Year Effect		Yes	Yes	Yes
Firm Effect		Yes	Yes	Yes
Adjusted R^2		0.898	0.898	0.898
Observations		711	711	711

Regression analysis is extended from Eq.(4.1) or Eq.(4.2) by adding a post-dummy with all variables. All variables except Q_SO are deflated by the number of shares outstanding at the fiscal-year end. The sample includes the observations during 2001-2014. The dependent variable is equity market value at 3 months after fiscal year-end; DER: net fair value of trading derivative instruments; POST: 0 (1) if the observation is in the pre-SFAS 161 (post-SFAS161) period. Q_SO: the quintile ranks of the percentage of institutional ownership or the number of analyst following scaled to be between 0 and 1. The standard errors are clustered by firm and shown in the parentheses.*** p<0.01, ** p<0.05, * p<0.1 is based on one-tailed t-tests when coefficient sign is predicted, and based on two-tailed t-tests otherwise.

Panel C: Value Relevance for Sophistication Quintile across SFAS 161 Enactment

	Predicted Sign	Institutional Ownership	Analysts Following
DER*Q1_SO	+	-0.785	-0.596
		(1.832)	(4.127)
DER*Q2_SO	+	0.135	0.097
		(1.246)	(3.028)
DER*Q3_SO	+	1.054	0.790
		(0.841)	(1.963)
DER*Q4_SO	+	**1.973****	**1.483***
		(0.906)	**(1.037)**
DER*Q5_SO	+	**2.893****	**2.176*****
		(1.376)	**(0.916)**
DER*Q1_SO*POST	+	3.093	3.055
		(2.505)	(5.282)
DER*Q2_SO*POST	+	**2.586***	2.654
		(1.780)	(3.811)
DER*Q3_SO*POST	+	**2.078****	2.253
		(1.238)	(2.399)
DER*Q4_SO*POST	+	**1.570***	**1.852***
		(1.171)	**(1.257)**
DER*Q5_SO*POST	+	1.063	1.451
		(1.638)	(1.416)

Regressions analysis is extended from Eq. (4.2) by adding a post-dummy with all variables. All variables except the quintile rank of institutional ownership or analyst following are deflated by the number of shares outstanding at the fiscal-year end. The sample includes the observations during 2001-2014. The dependent variable is equity market value at 3 months after fiscal year-end; DER: net fair value of trading derivative instruments; Q1_SO (Q2_SO through Q5_SO): the first (second through fifth) quintile ranks of the percentage of institutional ownership or the number of analyst following; POST: 0 (1) if the observation is in the pre-SFAS 161 (post-SFAS161) period. Predicted coefficients for each quintile are derived from the marginal effect of DER*SO and DER*SO*POST on Panel B, and the delta-method (Oehler 1992) is used to estimate the standard errors shown in the parentheses.*** p<0.01, ** p<0.05, * p<0.1 is based on one-tailed t-tests as coefficient sign is predicted.

Based on Panel A of Table 5.3 for Eq. (4.2), among the firms in the bottom quintile of institutional ownership in the post-SFAS 161 periods, investors view trading derivatives positively and place greater weight on these derivatives than before (as Eq. (4.2) DER is larger for post-161 than for pre-161). Panel C further reveals that not the firms in the top or bottom quintile of institutional ownership but the ones in the middle quintiles are significant for the change in value relevance post-SFAS 161. Although less conclusive for analyst following as a proxy for investor sophistication, the results suggest a quadratic relation between the level of investor sophistication and the significance of the value relevance changed after SFAS 161. One possible explanation is that the firms in the top quintile are already equipped with a relatively affluent information environment for investors, who are also capable of using the information to assist their valuation properly before the new disclosure. In contrast, the benefits from SFAS 161 are uncertain for the firms in the bottom quintile either because investors have limited attention for derivatives disclosure or because the transparent disclosure remains complex to most of the unsophisticated investors. The finding supports H2b and H2c partially.

Overall, the results support: (1) the value relevance of trading derivatives increases after SFAS 161, (2) before SFAS 161 the firms with a high investor sophistication clientele have higher value relevance than their lower counterparts, and (3) the firms with high institutional ownership also benefit from the new standard excepting the ones with the highest level of institutional ownership. Even though trading derivatives have been recognized into the bottom line of financial statements, the new disclosure requirements not only are more relevant to investors' assessment but also close the divergence in value relevance between the firms with

different level of investor sophistication. As so, the value relevance increase is observed among firms with all levels of investor sophistication but to different extents.

5.3 Incremental Value Relevance of Subcategory Information

Table 5.4 compared the model fitness (adjusted R^2) between two nested models; one with total net fair value of trading derivatives only (baseline model; Eq. (4.3a)) and the other with total and each subcategory's net fair value (extended model; Eq. (4.3b)). The likelihood ratio test shows that the inclusion of net fair value from subcategory significantly improves the model fitness in the post-SFAS 161 while such inclusion does not for the pre-161 periods, suggesting that tabular format further enhances the value relevance by providing more precise risk exposure from each subcategory. The same conclusion is reached from the F-test on the coefficients of subcategories' net fair value. Further F-test was conducted on the coefficients of interaction terms of sophistication dummy and subcategories' net fair value. The results reveal that the difference is significant in the pre-161 periods between high and low investor sophistication in terms of institutional ownership or analyst following, but such difference is insignificant after SFAS 161's implementation. The finding confirmed that the firms with high investor sophistication have better value relevance of trading derivatives than their lower counterparts, and it supports that subcategory information through tabular format required by SFAS 161 enhances the value relevance and narrows the gap between firms with investor clientele of varying sophistication.

Table 5.4. Incremental Value Relevance of Subcategory Information

	Pre-SFAS 161 Period			Post-SFAS 161 Period		
	Chi-squared	F-statistic	p-value	Chi-squared	F-statistic	p-value
Overall sample						
Likelihood-ratio test	3.25		0.5177	**9.39**		**0.0521**
F-test						
$\beta_{7,1}= \beta_{7,2}= \beta_{7,3}= \beta_{7,4}=0$		0.79	0.5318		**2.29**	**0.0602**
Investor sophistication						
F-test						
$\beta_{8,1}= \beta_{8,2}= \beta_{8,3}= \beta_{8,4}=0$						
Institutional ownership		**2.33**	**0.0557**		0.46	0.7634
Analyst following		**2.50**	**0.0424**		0.75	0.5561

The sample includes the observations during 2001-2014. The analyses are estimated separately for the Pre-SFAS 161 period (2001-2008) and the Post-SFAS 161 period (2009-2014). To test whether incremental value relevance is significant from subcategory information disclosed in the footnotes regarding trading derivatives, the analyses for overall sample are either to use likelihood-ratio test on comparing Eq. (4.3a) and Eq. (4.3b) or to conduct equality test (F-test) on the coefficients of net fair value of subcategories in terms of risk exposures including interest rate, foreign exchange, equity derivative, and commodity and others. Further, to test whether incremental value relevance from the subcategory differs between investor sophistication, Eq. (4.3c) is estimated, and investor sophistication is defined as the percentage of institutional ownership or the number of analyst following; the firm is categorized in high (low) institutional ownership or the number of analyst following if its percentage of institutional ownership or number of analyst following is above (below) the median of the sample for each year. Equality test (F-test) is conducted on the interaction term of net fair value of subcategories and the dummy variable for investor sophistication.

$$MVE_{it} = \beta_0 + \sum_{t=1}^{T-1} \beta_{01,t}\, Y_t + \sum_{i=1}^{K-1} \beta_{02,p}\, BHC_i + \beta_1 FVFA_{it} + \beta_2 FVFL_{it} + \beta_3 NFA_{it} + \beta_4 NFL_{it} + \beta_5 NPL_{it} + \beta_6 CORE_{it} + \beta_7 DER_{it} + \varepsilon_{it} \quad (4.3a)$$

$$MVE_{it} = \beta_0 + \sum_{t=1}^{T-1} \beta_{01,t}\, Y_t + \sum_{i=1}^{K-1} \beta_{02,p}\, BHC_i + \beta_1 FVFA_{it} + \beta_2 FVFL_{it} + \beta_3 NFA_{it} + \beta_4 NFL_{it} + \beta_5 NPL_{it} + \beta_6 CORE_{it} + \beta_7 DER_{it} + \beta_{7,1} DER\_I_{it} + \beta_{7,2} DER\_F_{it} + \beta_{7,3} DER\_E_{it} + \beta_{7,4} DER\_C_{it} + \varepsilon_{it} \quad (4.3b)$$

$$MVE_{it} = \beta_0 + \sum_{t=1}^{T-1} \beta_{01,t}\, Y_t + \sum_{i=1}^{K-1} \beta_{02,p}\, BHC_i + \beta_1 FVFA_{it} + \beta_2 FVFL_{it} + \beta_3 NFA_{it} + \beta_4 NFL_{it} + \beta_5 NPL_{it} + \beta_6 CORE_{it} + \beta_7 DER_{it} + \beta_{7,1} DER\_I_{it} + \beta_{7,2} DER\_F_{it} + \beta_{7,3} DER\_E_{it} + \beta_{7,4} DER\_C_{it} + \beta_8 D\_SO * DER_{it} + \beta_{8,1} D\_SO * DER\_I_{it} + \beta_{8,2} D\_SO * DER\_F_{it} + \beta_{8,3} D\_SO * DER\_E_{it} + \beta_{8,4} D\_SO * DER\_C_{it} + \beta_9 D\_SO + \varepsilon_{it} \quad (4.3c)$$

D_SO is replaced with D_INSTOWN or D_NUMEST in the analyses here. All variables except D_INSTONWN and D_NUMEST are deflated by the number of shares outstanding at the fiscal-year end. The dependent variable is equity market value at 3 months after fiscal year-end; FVFA: aggregate fair value of financial assets excluding trading derivatives; FVFL: aggregate fair value of financial liabilities excluding trading derivatives; NFA: aggregate book value of nonfinancial assets; NFL: aggregate book value of nonfinancial liabilities; NPL: nonperforming loans; CORE: domestic deposits minus time deposits; DER: net fair value of trading derivative instruments; DER_I: net fair value of trading derivatives instruments with risk exposure to interest rate; DER_F: with risk exposure to foreign exchange; DER_E: with risk exposure to equity derivative; DER_C: with risk exposure to commodity and others; D_INSTOWN: 0 (1) if the percentage of institutional ownership is below (above) the annual median; D_NUMEST: 0 (1) if the number of analyst following is below (above) the annual median. Year-dummies and firm dummies are included. Likelihood ratio test is conducted on adjusted R^2 of Eq. (4.3a) and Eq.(4.3b), and chi-squared shows the extent of difference between two equations for pre-SFAS 161 or post-SFAS 16. F-test is based on whether coefficients of the variables of interest are equal to zero. P-value is based on two-tailed test.

5.4 Additional Tests

5.4.1 Future Abnormal Returns for Trading Derivatives

Value-relevance analysis shows whether or not accounting numbers of interest can explain firms' stock price, and any finding of a difference in value relevance suggests that the efficiency of market participants and/or information formats changed across the periods. Financial derivatives are known for their high leverage and great variation of outcomes. For the same dollar amounts of fair value reported on a balance sheet, cash flows in the near future are more sensitive to derivative instruments than other assets. Due to these characteristics, investors misjudge a firm's risk if they do not interpret the information properly. Failing to adjust the supposed risk premium for the reported derivatives, investors overprice or underprice the stock, resulting in a price adjustment in the future. In other words, future abnormal returns are expected to be negative if investors treat trading derivatives indifferently from other items, while future abnormal returns are positive if investors overly discount these instruments due to their aversion to unfamiliar firms' practice such as derivative transactions.

Assuming no other derivative-related information channels outside financial reporting available to market participants and given the fact that the disclosure regarding trading derivatives was complex to the participants before SFAS 161, the stock price does not reflect the risk for trading derivatives. As a result, future abnormal returns exist for banks' trading derivatives before SFAS 161. On the other hand, given that sophisticated investors are more capable of processing derivatives disclosure before Statement 161, the future abnormal returns for derivatives are expected to be found less among the firms with more investor sophistication

than among their lower counterparts. Further, if Statement 161 indeed clarifies the underlying risks and facilitates market participants' understanding toward trading derivatives, then the mispricing is expected to be reduced after its enactment.

To test whether market participants price trading derivatives properly, the following models use 12-month size-adjusted returns beginning three months after the fiscal year-end to proxy firm's future abnormal returns (SAR_{t+1}). Eq. (5.1a) is the baseline model while Eq. (5.1b) further includes an interaction term with investor sophistication.[17] If the market underprices (overprices) the reported numbers and the correction happens in the subsequent year, then ϕ_7 and δ_7 would be significantly positive (negative). The dummy variable (D_SO) indicates whether the firm's institutional ownership or analyst following is above or below the annual median. The coefficient δ_8 shows whether the mispricing is different between high and low investor sophistication. The models are estimated separately before and after SFAS 161 period.

$$SAR_{i,t+1} = \phi_0 + \phi_1 FVFA_{it} + \phi_2 FVFL_{it} + \phi_3 NFA_{it} + \phi_4 NFL_{it} + \phi_5 NPL_{it} + \phi_6 CORE_{it} + \phi_7 DER_{it} + \varepsilon_{it} \quad (5.1a)$$

$$SAR_{i,t+1} = \delta_0 + \delta_1 FVFA_{it} + \delta_2 FVFL_{it} + \delta_3 NFA_{it} + \delta_4 NFL_{it} + \delta_5 NPL_{it} + \delta_6 CORE_{it} + \delta_7 DER_{it} + \delta_8 D\_SO * DER_{it} + \varepsilon_{it} \quad (5.1b)$$

Table 5.5 shows that future abnormal returns for trading derivatives are found in the pre-SFAS 161 period but not in the post-SFAS 161 period.

[17] The explanatory variables are deflated by outstanding shares of common stock to control the scale effects. Using total assets or market equity value doesn't change the inference.

Table 5.5. Future Abnormal Returns--Net Fair Value of Trading Derivatives

	Predicted Sign	Pre-SFAS 161 Period			Post-SFAS 161 Period		
		Eq.(5.1a)	Eq.(5.1b)	Eq.(5.1b)	Eq.(5.1a)	Eq.(5.1b)	Eq.(5.1b)
FVFA	?	0.003	0.003	0.003	-0.005	-0.005	-0.005
		(0.004)	(0.004)	(0.004)	(0.006)	(0.007)	(0.006)
FVFL	?	-0.004	-0.003	-0.003	0.005	0.005	0.005
		(0.004)	(0.004)	(0.004)	(0.007)	(0.007)	(0.007)
NFA	?	0.007**	0.007*	0.007*	0.000	0.000	0.000
		(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
NFL	?	-0.006+	-0.006+	-0.006+	0.005	0.005	0.005
		(0.004)	(0.004)	(0.004)	(0.006)	(0.006)	(0.006)
NPL	?	0.022	0.022	0.022	-0.012**	-0.012**	-0.012**
		(0.027)	(0.027)	(0.027)	(0.006)	(0.006)	(0.006)
CORE	?	-0.000	-0.000	-0.000	0.001*	0.001*	0.001*
		(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
DER	**+/-**	**0.036****	**0.105**	**0.117**	**-0.000**	**0.055**	**0.010**
		(0.016)	**(0.103)**	**(0.112)**	**(0.021)**	**(0.049)**	**(0.051)**
DER*D_INSTOWN	**-/+**		**-0.072**			**-0.057**	
			(0.106)			**(0.052)**	
DER*D_NUMEST	**-/+**			**-0.084**			**-0.011**
				(0.115)			**(0.049)**
Adjusted R-squared		0.042	0.041	0.041	0.023	0.021	0.019
Observations		407	407	407	300	300	300

The regression analysis is based on Eq. (5.1a) or (5.1b), where Q_SO is replaced with Q_INSTOWN or Q_NUMEST in the analyses here. All independent variables except D_INSTWON and D_NUMEST are deflated by the number of shares outstanding at the fiscal-year end. The sample includes the observations during 2001-2014; Pre-SFAS 161 period (2001-2008) and Post-SFAS 161 period (2009-2014). The dependent variable SAR is the 12-month size-adjusted returns beginning three months after the fiscal year-end; FVFA: aggregate fair value of financial assets excluding trading derivatives; FVFL: aggregate fair value of financial liabilities excluding trading derivatives; NFA: aggregate book value of nonfinancial assets; NFL: aggregate book value of nonfinancial liabilities; NPL: nonperforming loans; CORE: domestic deposits minus time deposits; DER: net fair value of trading derivative instruments; D_INSTOWN (D_NUMEST): 1 if the percentage of institutional ownership (the number of analyst following) is above the annual median, 0 otherwise. All results are based on two-tailed t-test and robust-adjusted standard errors in the parentheses. *** p<0.01, ** p<0.05, * p<0.1, + p<0.2

Alternatively, future abnormal returns are examined in an income model. Earnings are defined as annual income before extraordinary items and tax. Earnings contain earnings excluding the change in trading derivatives (NDX) and annual change in net fair value of trading derivatives (DX). Eq. (5.2a) is the baseline model while Eq. (5.2b) further includes an interaction term with a dummy of investor sophistication (D_SO). The models are estimated separately for before and after SFAS 161 period to see whether any explanatory variable is significant.

$$SAR_{i,t+1} = \phi_0 + \phi_1 NDX_{it} + \phi_2 DX_{it} + \varepsilon_{it} \quad (5.2a)$$

$$SAR_{i,t+1} = \delta_0 + \delta_1 NDX_{it} + \delta_2 DX_{it} + \delta_3 D\_SO * NDX_{it} + \delta_4 D\_SO * DX_{it} + \varepsilon_{it} \quad (5.2b)$$

A similar inference is made on the basis of the income model in Table 5.6. The evidence suggests that derivative disclosure is not completely substituted by other information venues.

Table 5.6. Future Abnormal Returns--Change in Net Fair Value of Trading Derivatives

	Predicted Sign	Pre-SFAS 161 Period			Post-SFAS 161 Period		
		Eq.(5.2a)	Eq.(5.2b) Institutional Ownership	Eq.(5.2b) Analyst following	Eq.(5.1a)	Eq.(5.2b) Institutional Ownership	Eq.(5.2b) Analyst following
NDX	?	-0.006	0.021^{+}	0.014	-0.008	-0.027	-0.033
		(0.013)	(0.016)	(0.019)	(0.008)	(0.025)	(0.032)
DX	**+/-**	**0.062***	**0.125****	**0.085**	**-0.000**	**0.024**	**-0.043**
		(0.034)	**(0.063)**	**(0.080)**	**(0.018)**	**(0.035)**	**(0.106)**
NDX*D_SO	?		-0.063**	-0.034^{+}		0.029	0.036
			(0.028)	(0.026)		(0.025)	(0.032)
DX*D_SO	**-/+**		**-0.115^{+}**	**-0.051**		**-0.038**	**0.051**
			(0.076)	**(0.089)**		**(0.037)**	**(0.107)**
Adjusted R-squared		0.042	0.041	0.041	0.023	0.021	0.019
Observations		357	357	357	249	249	249

The regression analysis is based on Eq.(5.2a) and (5.2b). All independent variables except D_SO are deflated by the number of shares outstanding at the fiscal-year end. The sample includes the observations during 2001-2014; Pre-SFAS 161 period (2001-2008); Post-SFAS 161 period (2009-2014). The dependent variable SAR is the 12-month size-adjusted returns beginning three months after the fiscal year-end; NDX: earnings excluding the change in trading derivatives; DX: annual change in net fair value of trading derivatives; D_SO: 1 if the percentage of institutional ownership or the number of analyst following is above the annual median, 0 otherwise. All results are based on two-tailed t-test and robust-adjusted standard errors in the parentheses. *** p<0.01, ** p<0.05, * p<0.1, + p<0.2

5.4.2 Value Relevance of Trading Derivative Gains and Losses and Non-trading Derivatives

The change in fair value of trading derivatives is recognized as part of the earnings until the position is closed. Trading derivatives gains and losses accumulates those changes over the fiscal year, and such accounting numbers are only found in firm's footnote disclosure. Modified from Kilic et al. (2013), the models are used to examine whether investors value trading

derivatives gains and losses different from the other components in annual earnings.[18] In Eq. (5.3), SAR is 12-month size-adjusted returns. EBTD is annual earnings before tax expense and trading derivative gains and losses. DERGL is annual trading derivative gains and losses collected from 10-K footnotes. If investors treat two components differently, then the coefficient should not be the same. Since trading derivative gains and losses is only available after firms file their 10-K, I look at both fiscal year-end and three months after the fiscal year-end to see how the valuation of related components could be with and without the footnote disclosure.

$$SAR_{i,t} = \theta_0 + \theta_1 EBTD_{i,t} + \theta_2 DERGL_{it} + \varepsilon_{it} \quad (5.3)$$

According to the textual analyses, only a small portion of banks disclosed in their footnotes but are more likely to do so after SFAS 161's enactment. Based on the frequency of the disclosure, the analysis is only conducted for post-SFAS 161 and assumes no gains and losses for those firms without disclosure. Using 12-month size-adjusted returns, Table 5.7 shows that, over the fiscal year, the market participants give similar weights on both trading gains and losses and other earnings components, though the standard error is larger for gains and losses from trading derivatives so that the estimation is insignificant. In contrast, the table reveals that, over the 12 months which starts 3 months after the fiscal year-beginning, the income from trading derivatives is downgraded and valued differently from other earnings components. Since trading derivative gains and losses are only available after 10-K filing, though not conclusive, the finding implies that the disclosure makes a difference to the relevance.

[18] Similar models are used by Wahlen (1994), Liu and Ryan (1995), Beaver et al. (1997), Ahmed et al. (1999), and Kanagaretnam et al. (2009) for value relevance of earnings components in the banking industry.

Table 5.7. Value Relevance of Trading Derivative Gains and Losses

	Predicted Sign	SAR_F	SAR_3	SAR_D
EBTD	+	0.470***	0.591***	0.121
		(0.151)	(0.204)	(0.144)
DERGL	+	0.405	-0.066	-0.471
		(1.394)	(0.641)	(0.984)
Constant	?	-0.047**	-0.099***	-0.052***
		(0.023)	(0.021)	(0.017)
Adjusted R^2		0.212	0.415	0.016
Observations		252	252	252
F-test: $\theta_1=\theta_2$				
F-statistics		0.00	1.16	0.37
p-value		0.963	0.283	0.546

The regression is based on Eq.(5.3). The sample consists of bank-year observations from 2010 to 2014. SAR_F: the 12-month stock returns over the fiscal year adjusted with corresponding size portfolio returns; SAR_3: the 12-month stock returns starting three months after the fiscal year-beginning adjusted with corresponding size portfolio returns; SAR_D: the returns difference between SAR_F and SAR_3; EBTD: annual income before taxes and trading derivative gains and losses scaled by beginning market value of equity; DERGL: annual trading derivative gains and losses scaled by beginning market value of equity; All results are based on robust adjusted standard errors in the parentheses. Equality test (F-test) is conducted on the estimated coefficient of EBTD (θ_1) and the estimated coefficient of DERGL (θ_2). The standard errors are robust-adjusted and shown in the parentheses.*** p<0.01, ** p<0.05, * p<0.1 is based on one-tailed t-tests when coefficient sign is predicted, and based on two-tailed t-tests otherwise.

To see whether derivative disclosure under SFAS 161 also affects the value relevance of non-trading derivatives, Eq. (4.1) was also estimated in Table 5.8 for net fair value of the non-trading derivatives, and the coefficient for derivatives with other than trading purposes is close to one across the periods. In contrast, the value weight on trading derivatives becomes greater after SFAS 161. As so, the results confirmed that the impact is made to trading derivatives rather than to non-trading derivatives.

Table 5.8. Value Relevance of Non-trading Derivatives

	Predicted Sign	Pre-161	Post-161	Difference
FVFA	+	0.963**	1.086***	0.122
		(0.393)	(0.266)	(0.473)
FVFL	-	-0.953**	-1.162***	-0.209
		(0.418)	(0.301)	(0.513)
NFA	+	0.574*	1.147***	0.572
		(0.309)	(0.336)	(0.455)
NFL	-	-0.472	-1.135***	-0.663*
		(0.403)	(0.320)	(0.512)
NPL	-	-5.188***	-0.678***	4.510***
		(0.831)	(0.232)	(0.860)

CORE	+	0.079	0.118***	0.039
		(0.069)	(0.030)	(0.075)
DER	+	1.903**	3.530***	1.627*
		(0.813)	(0.733)	(1.090)
DER_NO	**+**	**1.072**	**0.824**	**-0.248**
		(1.112)	**(1.163)**	**(1.601)**
Year Effect		Yes	Yes	Yes
Firm Effect		Yes	Yes	Yes
Adjusted R^2		0.818	0.963	0.897
Observations		408	303	711
F-test: $\beta_{DER}=\beta_{DER\_NO}$				
F-statistics		0.48	4.00	2.23
p-value		0.492	0.051	0.139

The regression is extended from Eq.(4.1) by adding DER_NO and excluding it from FVFA/FVFL. All variables are deflated by the number of shares outstanding at the fiscal-year end. Pre-161 is year 2001-2008 while Post-161 is year 2009-2014. The dependent variable is equity market value at 3 months after fiscal year-end; FVFA: aggregate fair value of financial assets excluding derivative instruments; FVFL: aggregate fair value of financial liabilities excluding derivative instruments; NFA: aggregate book value of nonfinancial assets; NFL: aggregate book value of nonfinancial liabilities; NPL: nonperforming loans; CORE: domestic deposits minus time deposits; DER: net fair value of trading derivative instruments; DER_NO: net fair value of non-trading derivative instruments. The standard errors are clustered by firm and shown in the parentheses. Equality test (F-test) is conducted on the estimated coefficient of DER (β_{DER}) and DER_NO (β_{DER_NO}).*** p<0.01, ** p<0.05, * p<0.1 are based on one-tailed t-tests as coefficient signs are predicted.

CHAPTER 6

CONCLUSION

Since the enactment of SFAS 133, criticism has arisen for accounting complexity and inadequate disclosure on derivative instruments and hedging activities. Derivatives are considered relatively innovative and complex, thus inadequate disclosure on these items makes it even more complex for financial reporting users to understand. To address the issue, SFAS 161 provides a guideline for firms to disclose in a way that investors can map the disclosure of derivative instruments to the numbers reported on financial statements. Textual analyses show that banks changed their derivative disclosure after SFAS 161 became effective. Specifically, banks increased the number of pages to report their derivative activities and became more likely to disclose trading derivative gains and losses in their footnotes, meaning that these firms have been attentive to elaborate their disclosures under SFAS 161.

This study provides evidence that given trading derivatives recognized under SFAS 133, derivative disclosure required by SFAS 161 supplements the information lost due to the aggregation process in accounting recognition. This study found an increase in the value relevance of trading derivatives after SFAS 161, suggesting that the new standard is relevant to market participants. Using one-year future adjusted returns as a proxy for mispricing, the finding also shows that abnormal returns are found less often post-SFAS 161, indicating that the new disclosure requirement provides additional information and that it cause an impact on investors' valuation, whether they have rational considerations or psychological biases toward disclosure.

Value relevance is also associated with the level of firms' investor sophistication. Empirical results show that, before Statement 161, the firms with high sophistication placed

greater weight on trading derivatives than their counterparts with lower sophistication, but the difference narrowed after the enactment, showing that complexity impacts investors with different levels of information processing ability unequally. On one hand, the new disclosure reconciles the discrepancies between market participants and helps them reach a consensus. On the other hand, disclosure also benefits the firms with high investor sophistication excepting those with the highest degree of sophistication. Consequently, the value relevance increase is prevalent among firms with all levels of investor sophistication, but to different extents.

Overall, this paper indicates that footnote information regarding derivatives is processed differently by financial report users in terms of their investor sophistication. It also reveals that efforts spent on disclosure are worthwhile even when the disclosure contents cover the instruments with complex features such as financial derivatives. The results not only confirm the positive role played by SFAS 161 in assisting users of financial reports but also suggest that investor sophistication matters to the value relevance of financial derivatives, while enhanced disclosure can reduce the role of sophistication and level the playing field for market participants. Findings from this study can contribute as a reference for future discussions about the role of footnote disclosure before a comprehensive solution becomes available to fair value accounting.

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BIOGRAPHICAL SKETCH

Xiang-Yu (Sean) Huang was born and raised in Taiwan. Like many other undergraduate students in business school, he was required to take his first accounting class shortly after getting into college. Accounting was not his major at that time, but soon he came to realize that he was good at solving accounting problems and was fascinated by the beauty of the double-entry accounting systems. He switched his major and earned his bachelor's and master's degrees both in accounting. After that, he worked as an accountant for central and local governments in Taiwan. He has experience preparing financial statements for an entity with more than 100 affiliation units and a budget of 2 billion US dollars (equivalent). The reports were a reference for budget resolution and were used to brief the mayor and council members. He next joined the PhD program in Management Science with a concentration in Accounting at The University of Texas at Dallas and has taught financial accounting while studying in the program.

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