Firm Hedging Decision and Its Value Implication

by

Han Jin

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Approved by

Beverly Marshall, Chair, Professor of Finance
Jitka Hilliard, Professor of Finance
Jimmy Hilliard, Professor of Finance
Keven Yost, Associate Professor of Finance

Abstract

In Chapter 1, we study the impact of increased transparency in the reporting of OCI on firms' foreign currency cash flow hedging practice and the value relevance of this change. We find a reduced level of foreign currency cash flow hedging among firms that experienced the greatest volatility of unrealized hedging gains and losses while reported these items opaquely before mandated increase in transparency. Our results show that cash flow hedging is value relevant only when reported in a more transparent format and that the increase in transparency reduces information asymmetry. Consistent with managers' fears of investor confusion following additional transparency, we show that investors unsymmetrically incorporate the implications of unrealized hedging gains and losses.

In Chapter 2, we find the mandated increase in OCI reporting transparency eliminated the difference between sophisticated and non-sophisticated investors in the usefulness of the information. We also find investors value efforts by managers to reduce translation exposure through net investment hedging and pay greater attention toward translation losses which drives management hedging, particularly when the information is reported transparently.

In Chapter 3, I decompose the translation adjustment into temporary and long-term portions. I find that investors are able to distinguish the long-term and temporary components of the translation adjustment, and properly impound only the long-term portion in stock pricing. The results also show that managers adjust their net investment hedging decision based mainly on the long-term translation impact. The transitory/temporary portion has limited impact on either the decision to hedge or level of hedging. I also find that managers are more likely to hedge and hedge more when they face long-term translation losses.

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Table of Contents

List of Tables

List of Figures

Chapter 1

Shedding light on foreign currency cash flow hedges: Transparency and the hedging decision

1. INTRODUCTION

Are Comprehensive Income items useful to investors? Has increased transparency of this information improved the usefulness of this information or contributed to confusion? Accounting authorities feel strongly that this information is valuable to investors and should have greater prominence in the financial statement. On the other hand, the majority of managers responding to the proposed mandate for increased transparency of Other Comprehensive Income (OCI) items expressed strong concerns that greater prominence of this information would serve to increase investor confusion. One potentially confusing OCI item for investors relates to unrealized gains and losses from hedging activities. If managers' concerns over investor confusion dominate the benefits to investors of increased transparency, a change in hedging behavior could occur when transparency of hedging results is mandated. In this study, we examine how the change in reporting transparency of unrealized cash flow hedging gains and losses impacts firm value and information asymmetry and whether managers alter their hedging practice accordingly.

As the use and complexity of derivative instruments has increased, accounting authorities have worked to address concerns regarding the financial reporting of hedging activities. Statement of Financial Accounting Standard (FAS) 133, issued in 1999, established the accounting rules for hedges but removed most derivative disclosure required by the superseded FAS 119. In response to concerns that there was not "adequate information about how derivative and hedging activities affect an entity's financial position, financial performance, and cash

flows,[1]" FAS 161 required additional derivative and hedging footnote disclosures but did not modify derivative accounting.

While footnote disclosure of derivative activities improved transparency, unrealized gains and losses from these activities remained buried by most firms in the Statement of Shareholders' Equity (SSE). In 2010, the Financial Accounting Standard Board (FASB) issued an exposure draft (FASC 220) eliminating two of the options for presenting Comprehensive Income (CI). FASC 220 proposed a single income statement with the "bottom line" being CI. There was no change in the accounting of OCI items or the level of disclosure. While most comment letters opposed increased transparency of CI and its components, some were clearly supportive.[2] The final reporting requirement under Accounting Standard Update (ASU) 2011-05 increased the financial statement prominence of OCI items but allowed firms to report in a separate Statement of Comprehensive Income (SCI). ASU 2011-05 did not change the nature of the items recognized as OCI.

Campbell, Mauler, and Pierce (2019) summarize the substantial research establishing that derivatives allow firms to reduce their cost of capital and increase firm value by smoothing cash flows and earnings. While the ex-ante literature documents many benefits to hedging, concerns over increased transparency of hedging results may serve as a deterrent for managers. Previous research suggests that investors may draw incorrect inferences from hedging gains and losses. Koonce, Lipe and McAnally (2005) show that the labels firms use to describe financial instruments have a powerful effect on investors' risk judgements and only the loss label causes investors to make erroneous inferences about undisclosed gains. Makar, Wang, and Alam (2013)

[1] Statement of Financial Accounting Standards No. 161, March 2008, an amendment to FASB 133, page 3.
[2] Project 1790-100 –Online Comment Letters
https://www.fasb.org/jsp/FASB/CommentLetter_C/CommentLetterPage&cid=1218220137090&project_id=1790-100

find that investors underestimate the relation between future cash flows and OCI unrealized cash flow hedging gains and losses. Following FAS 133, Richie, Glegg, and Gleason (2006) show that hedged firms exhibited less earnings predictability. They conclude that the increased complexity of the financial statements made earnings more difficult to forecast. Even sophisticated investors incorrectly incorporate unrealized gains and losses into their earnings forecasts (Campbell, Downes and Schwartz 2015).

Before OCI received greater prominence under ASU 2011-05, Campbell (2015) showed that unrealized cash flow hedging gains (losses) signal that the underlying cash flow has experienced unrecognized losses (gains). Further, the author notes that if the underlying exposure is only partially hedged or the maturity of the hedging instrument is too short, then a reported cash flow hedging gain suggests a likelihood of future losses. The author finds that during the period of his sample (2001-2006), investors did not "immediately price in the cash flow information" and were subsequently "surprised by future realizations of gross margin." Campbell concluded that his findings were relevant to FASB and IASB policy makers attempting to "simplify the accounting and disclosure for derivatives and, in particular, cash flow hedges." His findings suggest that greater prominence of unrealized cash flow hedging gains and losses would improve the usefulness of this information and could potentially lead to its immediate impounding in firm value.

Although prior to ASU 2011-05 the option to provide greater prominence or transparency of OCI items existed, most firms reported this information only within the Statement of Shareholders' Equity (SSE). Managers previously choosing only to report within the SSE may have done so because they were apprehensive that greater visibility would lead to investor confusion, provide competitive information, or have management performance implications. As

documented in the many comment letters in response to FASC 220, managers were clearly concerned that increased transparency of OCI items, including unrealized hedging gains and losses, would simply serve to confuse investors. Firms that preferred opaque reporting when available had more OCI items and a larger absolute value of non-translation OCI (Lin, Martinez, Yang, and Wang 2018).

In addition to concerns over investor confusion, research suggests that competitors could benefit from the use of information provided by transparent reporting and that managerial concerns over their own performance may serve as a determent to transparency. Goncharov and Peter (2019) show that following increased transparency in segment reporting there were changes in cartel duration. Bamber, Jiang, Petroni, and Wang (2010) find that CEOs with stronger equity-based incentives and less job security preferred opaque OCI reporting when they had the option. They suggest that managers act as if they believe CI location matters despite the traditional market view that reporting location does not matter. This is consistent with the implications of limited attention and processing power (Hirshleifer and Teoh 2003), which suggests that reporting location matters even if it is informationally equivalent.

Cash flow (CF) hedges, which are the focus of this study, are a "hedge of the exposure to variability in the cash flows of a recognized asset or liability or of a forecasted transaction" (FAS 133, para 4). Unrealized CF hedge gains and losses reported in OCI allow recognition of the derivative position at its fair value on the balance sheet without affecting net income in the current period. Gains or losses from CF hedging are reclassified to net income when the underlying forecasted transaction is realized. While changes in the derivative position are reported in OCI, any change in the forecasted transaction being hedged is not recognized until the future. Therefore, FAS 133 accounting treatment results in an extreme mixed attribute

problem when applied to cash flow hedges as described in Gigler, Kanodia, and Venugopalan (2007). This attribute could contribute to misinterpretation by less sophisticated investors of these unrealized gains and losses following greater prominence. Disparity in the ability of sophisticated and unsophisticated investors to correctly price unrealized CF hedging gains and losses due to their accounting complexity, could lead to increased informational asymmetry rather than the typical expectation of increased transparency leading to reduced informational asymmetry among investors.

We make three contributions to the extant literature. The first contribution comes from whether the change in statement location benefited investors by reducing information asymmetry. We document evidence that increased transparency is associated with a reduction in investor opinion divergence. However, regardless of reporting location, the levels of investor divergence are greater among cash flow hedgers than non-hedgers and among firms with less sophisticated investors (lower institutional ownership).

The second contribution comes from examining the value relevance of cash flow hedging and impact of OCI volatility on firm value before and after the mandated statement transparency. While we find some support for investors placing value on a firm's hedging efforts, our results show that the volatility of OCI negatively impacts firm value when reported transparently. Consistent with the implications of limited attention and processing power (Hirshleifer and Teoh 2003; Cao and Dong 2020), investors did not impound firm value when the information was presented in a less salient manner. Once managers were no longer able to mitigate the negative impact of OCI volatility by reporting only in the SSE, a potential tradeoff between the benefits of cash flow hedging and investor response to more salient reporting of volatile hedging results could impact hedging behavior.

The third contribution comes from examining whether greater OCI prominence resulted in a change in FXCF hedging practice despite its documented benefits. We examine the probability of FXCF hedging and level of hedging after controlling for reporting transparency. We find some evidence that increased transparency resulted in a reduced likelihood of FXCF hedging. Our results show firms with the greatest volatility of FXCF hedging gains and losses reduce their level of FXCF hedging when forced to report transparently. This finding is consistent with comment letters suggesting that some firms feared additional transparency would only confuse users. Although CF hedging may be value enhancing regardless of reporting location, unrealized CF hedging results increase OCI volatility. Managers concerned about increased transparency appear to reduce the use of FXCF hedging to reduce OCI volatility and its potentially negative impact on firm value.

The remainder of the article proceeds as follows: the next section summarizes relevant literature; the third section provides the development of our hypotheses; the fourth section describes our research design, including data selection and variable construction; the fifth section presents the main results along with robustness tests; and the final section provides our concluding remarks.

2. BACKGROUND AND LITERATURE

We summarize the relevant literature on FXCF hedges specifically and CF hedges more broadly below. For a more thorough review of the accounting literature on derivatives research, we suggest Campbell et al. (2019). They point out that while there is vast research on why firms use derivatives, the ability to measure a firm's derivative use is still limited by the level of disclosure under accounting standards. Most research has relied on indicator variables or other imperfect measures of hedging activity such as the fair value amounts or reported gains and losses. The

streams of research can be broken down into information asymmetry and derivative disclosure (including studies on the consequences of changes in disclosure), consequences of derivative use on firm value, and the determinants of derivative use.

2.1 Information Asymmetry and Derivative Disclosure

Compared with the SSE format, prior literature suggests that the Income Statement (IS) and Statement of Comprehensive Income (SCI) formats increase OCI disclosure transparency (Hirst and Hopkins 1998; Wang and Men 2013). Prior studies have largely shown that additional disclosures regarding derivatives use help investors and are value relevant (Venkatachalam 1996; Wong 2000; Schrand 1997). Chen, Dou, and Zou (2018) conclude, "Mandatory disclosures lead to positive information externalities, which individual reporting entities have few incentives to achieve voluntarily." While greater transparency may be beneficial overall that benefit for cash flow hedgers may depend on the sophistication of investors using the information.

Steffen (2020) finds that FAS 161 disclosure changes reduced information asymmetry, as evidenced by reduced bid-ask spreads, but did not lead to reduced uncertainty about firm value. Campbell et al. (2015) examine whether FAS 161 implementation reduced or eliminated investor underreaction and find analysts fail to fully incorporate CF hedge information into their earnings forecasts. The authors show that when managers provide more transparent, complete, and forward-looking disclosures regarding CF hedges the associated mispricing is reduced. Campbell, Khan, and Pierce (2021) suggest that enhanced mandatory CF hedging disclosure following FAS 161 helped correct investors' previous mispricing of unrealized cash flow hedge gains/losses. They also find the correction is greater among firms in industries with heavier derivatives use, those that hedge multiple risk types and items, and those that did not provide voluntarily quantitative disclosure prior to the mandate.

While FAS 161 is an improvement to hedging disclosure, it does not require the disclosure of notional amounts often used as a gauge of derivatives usage under FAS 119. This leaves most researchers and investors to attempt to gauge the level of derivatives use by the reported fair value gains and losses. Wong (2000) suggests that for investors to perform complete exposure assessment, "derivative disclosures should disaggregate notional and fair value amounts by long and short positions, major currency, class of instrument, time to maturity, and leverage." Thankfully, most firms in our sample provide voluntary disclosure of notional amounts in sufficient detail to capture their level of hedging as of the financial statement date, however, the detail regarding specific currencies hedged is more limited.

2.2 Derivative Use and OCI on Firm Valuation

Optimal hedging theories suggest that firms use derivatives to reduce cash flow variation, which might otherwise preclude firms from investing in valuable growth opportunities. By reducing cash flow volatility, hedged firms face a lower probability of default and thus greater ability to finance all profitable growth opportunities. The lower probability of default also suggests a greater benefit from tax shields by increasing the use of leverage. Empirical evidence supports these benefits.

As summarized in Allayannis and Weston (2001), well-governed large firms that engage in FXCF hedging exhibit a premium in firm value. Examining hedging more broadly, Graham and Rogers (2002) find that hedging leads to increased debt capacity and hence tax benefits that accrue to the firm's value. Donohoe (2015) finds that initiating a derivatives program leads to a significant reduction in cash effective tax rates and Lee (2019) also finds weak evidence of a tax motivation for hedging. Chen and King (2014) show evidence that hedging is associated with a lower cost of debt, mainly by reducing bankruptcy risk, agency costs, and decreasing information

asymmetry. Similarly, Aretz, Bartram, and Dufey (2007) find an increase in firm value by nonfinancial corporations associated with hedging through its impacts on agency costs, costly external financing for funding of investment opportunities, bankruptcy and financial distress costs, and taxes. These findings are consistent with Smith and Stulz (1985) who theorize that by reducing the probability of bankruptcy and negative cash flow shocks through derivative use, levered firms can increase their value. Similarly, using a sample of firms in the Canadian oil and gas industry, Gilje and Taillard (2017) provide direct empirical evidence that the value implications of hedging (investment, firm value, and stock price effects) are concentrated among firms facing a higher probability of financial distress.

Conversely, other studies find that either hedging has no significant effect on firm value or suggest it leads investors to view the firm as more risky than non-hedgers. Jin and Jorion (2006) find hedging by oil and gas producers reduces the sensitivity of their stock price to oil and gas prices, but it has no effect on firm value. In contrasting their findings with Allayannis and Weston (2001), they conclude that there is a crucial difference between the nature of commodity risk exposure and foreign currency risk exposure. Brown (2001) shows that FX hedging is effective in reducing reported earnings volatility and can help obtain competitive advantages. They find that the evidence is weak that FX hedging has an impact on firm value although they do find it reduces the sensitivity of the stock price to exchange rate changes. Hirshleifer and Teoh (2003) using a limited attention approach suggest that hedging firms may be perceived by investors as riskier than non-hedgers in the case of cash flow hedges where hedging profits are marked-to-market while the underlying long-term business risk is not marked-to-market.

Research also suggests that investors may not correctly price information regarding derivatives use. Campbell (2015) provides evidence that current period unrealized CF hedge

gains/losses are negatively associated with future profitability and stock returns. However, he finds that investors do not immediately price the implications of CF hedge gains and losses. He concludes this explains why previous research has failed to document the value relevance of OCI and why managers are hesitant to embrace greater OCI transparency. He documents an abnormal return from buying firms with large unrealized losses and shorting those with large unrealized gains. However, Kanagaretnam, Mathieu, and Shehata (2009) show that both the winning positions and losing positions are positively priced by investors, suggesting that hedging is viewed as a signal of proactive risk management effort regardless of gains and losses.

Unrealized hedging gains and losses from cash flow hedges are just one component of OCI. Chambers, Linsmeier, Shakespeare, and Sougiannis (2007) show that OCI information is priced by investors post-SFAS 130 when the majority of firms reported OCI in SSE. Kanagaretnam et al. (2009) provides important evidence on the value relevance of aggregated CI. They find net income is a better predictor of future net income, while aggregated CI is a better predictor of future cash flows. They conclude that the components of OCI are value relevant but that due to their transitory nature they are poor predictors of future profitability. Lin et al. (2018) examines the value relevance of OCI before and after ASU 2011-05 and conclude that OCI information is consistently value relevant when reported in the SSE but it was only priced by investors when reported in the SCI if the magnitude of OCI volatility was significant. They find that the value relevance of OCI decreased for firms that changed reporting location. Kim (2017) also finds that OCI information is more value relevant when reported in SSE before ASU 2011-05 but shows that in the period after ASU 2011-05 OCI is only value relevant when reported in a separate statement. Huang, Cussatt, and Wong-On-Wing (2021), on the other hand, show that the value

relevance of OCI is higher when reported in the IS rather than SCI format following ASU 2011-05.

The implications of limited attention and processing power (Hirshleifer and Teoh 2003) suggest that the location of reporting matters even if it is informationally equivalent. They conclude that information presented saliently receives more of investors' limited attention, while investors may fail to attend to some non-salient information such as footnotes. Inattention in their model influences prices and is consistent with regulators mandating enhanced prominence to mitigate efforts by firms to exploit investor inattention to relevant information. More salient reporting of volatile OCI items could lead investors to change their perception of the firm's riskiness even though the information content has not changed. Using data in the period between 2005 and 2010, Khan and Bradbury (2014) find that greater incremental CI volatility (CI volatility incremental to net income volatility) is not priced by the market. In the post-ASU 2011-05 period, Cao and Dong (2018) show that incremental CI volatility is significantly negatively priced by the market. They also show that for firms forced to report more transparently, the negative association is more pronounced when OCI is reported in the more prominent IS format instead of the more common SCI format, supporting Hirshleifer and Teoh (2003) and consistent with Huang et al. (2021). Yen, Hirst, and Hopkins (2007) find that managers believe that the increase in OCI prominence would lead investors to use this information inappropriately and thus adversely affect their perceptions of performance.

Investors reduce the use of information when it is complex (Plumlee 2003) as complexity hinders their ability to extract information (Rees and Shane 2012). While aggregated OCI may be value relevant, the usefulness of OCI items related to unrealized hedging gains and losses is unclear. Koonce et al. (2005) experiential findings suggest that when confronted with an

information item involving the derivatives label (i.e., hedge or swap) it triggers "specific mental associations that systematically affect risk assessment in ways not explained by economic analysis." They go on further to say that this effect cannot be overcome by supplementary exposure information.

2.3 Determinants of Derivative Use

Firms exposed to greater exchange rate risk and expectations of volatile future cash flows are more likely to use FXCF hedges. FXCF derivative use has been shown to have a positive relation with a firm's foreign sales ratio (Allayannis and Ofek 2001; Lee 2019) geographic dispersion (Guay and Kothari 2003) and an imbalance of foreign currency revenues versus expenses (Richie et al. 2006). A firm's competitive position may also be a factor in their FXCF hedging choice. Firms in less competitive industries are better able to maintain their profit margins by passing the exchange rate effect on to their customers (Allayannis and Ihrig 2001) and as a result unrealized CF hedging gains and losses convey less information for these firms (Campbell 2015).

Examining the use of derivates more broadly, previous literature suggests that hedging has costs in terms of needed staffing for implementation and monitoring (Brown 2001) consistent with a positive relation between the hedging decision and firm size and profitability. Lee (2019) finds that derivative users are larger, more profitable (using ROA), more leveraged, have higher sales growth, and lower liquidity. Géczy, Minton, and Schrand (1997) find that firms with greater investment opportunities and tighter financial constraints tend to hedge more. Profitable firms may also have tax incentives associated with hedging. Graham and Smith (1999) show that profitable firms with net operating loss carryforwards (NOLs) can lower their expected tax liability by reducing the volatility of taxable income due to income tax convexity. However, Graham and Rogers (2002) find no evidence that firms hedge in response to tax convexity.

The extant literature provides evidence that given limited ability to eliminate risk on their own accounts, managers tend to moderate risk at the corporate level. Using a sample of gold mining firms, Tufano (1996) shows that managers' private exposure, captured by managerial stock and option holding, is associated with their choice of risk management. Graham, Harvey, and Rajgopal (2005) and Akron and Benninga (2013) conclude that as equity-linked compensation increases, managers tend to decrease their own risk by increasing hedging positions. Lee (2019) also finds evidence of a managerial ownership incentive for hedging. Barton (2001) finds a partial substitution effect between earnings smoothing and hedging as tools to reduce earnings volatility. Choi, Mao and Upadhyay (2014) find that the substitution relation between CF hedges and discretionary accruals is lower following the issuance of FAS 133. Their study provides evidence that FAS 133 led to increased earnings volatility, possibly due to practitioner concerns that derivative hedging would be less effective as a tool to smooth earnings.

On the other hand, a heightened awareness of reported hedging gains and losses in OCI by investors may contribute to managers' concerns regarding compensation when this information is reported more transparently. Maines and McDaniel (2000) provide evidence that nonprofessional investor assessments of firm and managerial performance reflect the volatility of CI when reported in a separate statement. Further, Rees and Shane (2012) describe gains and losses from CF hedges as having a low degree of persistence and not being part of core operations or under management control. They point to the issue that CI combines both nonrecurring and more persistent OCI items, thus limiting the usefulness of CI in explaining future cash flows and income.

3. Hypotheses Development

3.1 Information Asymmetry

As previously discussed, additional disclosures mandated by accounting authorities in the past have led to reduced information asymmetry (Campbell et al. 2021)). However, prior to ASU 2011-05, more than 70 percent of S&P 500 firms, reported OCI information only in the SSE rather than choosing a more transparent option. While sophisticated users of financial statements should have been able to find and use CF hedging information regardless of its reporting location, less-sophisticated investors may have previously been unaware of this value-relevant information. The result was a divergence of investor opinions due simply to the prominence of the information.

Accounting authorities believed ASU 2011-05 was necessary to bring greater visibility of OCI items and reduce information asymmetry. If accounting authorities are correct, then firms that previously buried OCI information within the SSE had higher levels of information asymmetry prior to ASU 2011-05. This leads to H1a:

H1a*: Information asymmetry is greater when firms report OCI only in the SSE format.*

Firms that engage in CF hedging activities have more complex OCI items than non-hedgers and therefore a greater potential for investor divergence in valuation. This leads to H1b:

H1b*: Firms that engage in CF hedging exhibit greater information asymmetry.*

If the accounting authorities are correct, we should expect information asymmetry associated with CF hedging to be reduced or eliminated with transparent reporting (H1c). Although we believe accounting authorities are correct, the polar responses to ASU 2011-05 suggest that overall firm managers did not embrace transparency. Their concern about the potential for investor confusion suggests that investors will not interpret the unrealized hedging

gains and/or losses correctly. If managers are correct, then more transparent reporting would only result in greater investor confusion. This leads to H1c (alternative).

***H1c**: The information asymmetry associated with CF hedging is lower after transparent reporting.*

***H1c (alternative)**: The information asymmetry associated with CF hedging is higher after transparent reporting.*

3.2. Firm Value

CF hedging is used to reduce cash flow volatility, which is viewed as an essential aspect of firm risk management. Thus, we should expect the increase in reporting transparency to enhance the notability of CF hedging and thus help investors recognize hedging benefits. However, according to Tufano (1996), managers make their hedging decision based on their private risk exposure and aversion rather than corporate risk management. If this is true, outside investors may not value hedging in that it contributes more to maximizing managerial utility rather than shareholders' utility. This leads to H2a and H2a (alternative):

***H2a**: CF hedgers exhibit higher firm value, and this relation is greater following increased transparency.*

***H2a (alternate)**: There is no value benefit associated with CF hedging before or after transparent reporting.*

Based on Hirshleifer and Teoh (2003) and Yen et al. (2007), greater visibility of OCI volatility could adversely affect investor's perceptions of performance. Therefore, we expect firms experiencing higher OCI volatility to be valued lower by investors when OCI is reported transparently. This leads to H2b:

***H2b**: Firm value is lower in the presence of OCI volatility when reported transparently.*

3.3 FXCF Hedging Participation and Level

We argue that firms previously preferring opaque reporting are those most concerned about the investor confusion associated with OCI information, including unrealized FXCF hedging gains and losses. These firms could attempt to mitigate the reporting of volatile hedging results by adjusting their hedging policy following the adoption (including early adoption) of ASU2011-05. In our examination of hedging practice, we focus on FXCF hedging only. This leads to H3a and H3b:

H3a*: The likelihood of engaging in FXCF hedging is reduced after transparency in OCI reporting.*

H3b*: The level of FXCF hedging is reduced after transparency in OCI reporting.*

For those already utilizing FXCF hedging, if managers' concern is mainly over reporting volatile hedging results, we expect managers of firms that experience the highest volatility of OCI items prior to reporting transparently to be those most concerned that investors will be distracted by reported unrealized hedging gains and losses in OCI when they become transparent. This leads to H1c:

H3c: *Those experiencing the highest volatility in OCI items prior to the increase in reporting transparency are most incentivized to reduce FXCF hedging.*

4. DATA and RESEARCH DESIGN

4.1 Sample Selection

We start with S&P 500 firms because most have both currency exposure and the necessary personnel to manage currency risk. Further, our sample period runs from 2010 to 2015, including the year that the provisions of ASU 2011-05 became mandatory. All firms included in the S&P 500 at any time during our sample period are included to avoid survivorship bias, resulting in

636 index constituents. We drop the firms that have had significant changes in ownership for any reason (IPO, spinoffs, significant mergers and/or acquisitions, etc.), resulting in 590 firms in our available sample.

We use Compustat Segments data, which provides some accounting data by geographic segments, to identify firms with foreign currency exposure. Of our initial sample of 590 firms, 403 firms have available data in the Compustat Segments dataset and report non-domestic sales, or export sales. We hand collect data on each sample firm's hedging policy, notional value of FXCF hedging, and the impact on OCI using the footnotes to the financial statements, either narrative or tabular. Due to missing data in constructing other FX exposure variables, our preliminary Exposed sample is reduced to 290 firms represented by 1,383 firm-year observations. Since only firms that cross the effective date of ASU 2011-05 are relevant to the hypotheses being tested, we exclude 73 firm-year observations belonging to 46 firms that drop out from our sample immediately before or after ASU 2011-05, leaving a final Exposed sample of 1,310 firm-year observation representing 244 firms across the effective date of ASU 2011-05. We provide a breakdown reconciling to our final sample below:

S&P 500 firms	**636**
Less firms with significant ownership changes	-46
Available sample	**590**
Less firms with no currency exposure or missing	-187
Currency exposure subsample	**403**
Less firms with missing data	-113
Less firms only pre or post ASU 2011-05	-46
Exposed sample	**244**

Firms had the choice of three locations for reporting comprehensive income prior to ASU 2011-05; Income Statement (IS), Statement of Changes in Shareholders' Equity (SSE), or a separate Statement of Comprehensive Income (SCI). We manually check the location for reporting comprehensive income used by our sample each year. Before ASU 2011-05, most

firms tended to display comprehensive income in SSE. For our sample, only 44 firms or 18% reported CI in a transparent format, either on the IS or in a separate statement prior to the mandated implementation of ASU2011-05 for publicly traded firms. For the 200 firms in our sample that were forced to shift to more transparent reporting, most had two years within the sample period of reporting in a less transparent manner and then four reporting years where OCI had greater financial statement visibility. Following mandated transparent reporting, most firms (95%) utilize the SCI format. This is consistent with the strong opposition to requiring the IS format clearly expressed by managers in their comment letters in response to FASC 220. While the IS approach enhances OCI value relevance compared with SCI reporting (Huang et al. 2021), managers expressed concern that investors would overreact to volatile OCI items when displayed with Net Income, resulting in CI as the new "bottom line" of the IS.

4.2 CF Hedging Transparency and Information Asymmetry

As discussed in 3.1, we expect opaque reporting of CF hedge information contributes to information asymmetry between managers and investors and among different investors. We expect that reporting transparently will either reduce or eliminate this additional asymmetry. Similar to Campbell et al. (2021), we test these hypotheses using the following model:

$$\begin{aligned} \textit{Information Asymmetry}_{i,t} = {} & a + \beta_1 SSE_{i,t} + \beta_2 CFHedge_{i,t} + \beta_3 CFHedge_{i,t}{*}SSE_{i,t} + \beta_4 NonSoph_{i,t} \\ & + \beta_5 NonSoph_{i,t}{*}SSE_{i,t} + \beta_6 Lmval_{i,t} + \beta_7 Big4_{i,t} + \beta_8\ GrowCap_{i,t} + \beta_9 Loss_{i,t} + \\ & \beta_{10} Coverage_{i,t} + \beta_{11} Surprise_{i,t} + \beta_{12} VolEarn_{i,t} + \varepsilon_{i,t} \qquad (1) \end{aligned}$$

The dependent variable, *Information Asymmetry*, is a measure by investor opinion divergence. A variety of proxies for measuring investor opinion divergence have been used in previous research. Campbell et al. (2015 and 2021) uses analyst earnings forecast error to examine the usefulness of information required by FAS 161. Other researchers use proxies based

on stock price (ex. cumulative abnormal returns), trading activity (ex. abnormal volume, bid-ask spread), or earnings (ex. earnings volatility). Garfinkel (2009) compares these different proxies. His results suggest that spreads and unexplained trading volume are the best proxies for opinion divergence and that volatility of stock returns and dispersion of analysts' forecasts are weaker proxies. We therefore employ spread and abnormal volume as two proxies for investor diversion. *Spread* is the daily percentage bid-ask spread, calculated as

$$Spread = \frac{Ask - Bid}{(Ask + bid)/2} \qquad (2)$$

where ask and bid prices are daily closing prices. We also use daily high ask and daily low bid prices as an alternative measure for robustness. Since *Spread* is a ratio variable bounded at zero, we also run a Tobit model using zero as the lower limit to prevent the predicted value will not fall below zero.

Following Dorminey and Apostolou (2012), we calculate abnormal trading volume, *abVol*, as the difference between average daily trading volume for firm *i* during the information period (IP) and the normal period (NP), adjusted by the difference between average daily trading volumes for the S&P 500 over the same period. Firm daily trading volume, VOL_i divided by $SHROUT_i$, is the percentage of shares that trade each day for firm i of shares outstanding. S&P 500 daily trading volume, VOL_{mk} divided by $SHROUT_{mk}$, is the percentage of shares that trade each day for the S&P 500 firms as a percentage of S&P 500 shares outstanding.

$$abVol_i = \left[\left(\frac{VOLi}{SHROUTi}\right)_{IP} - \left(\frac{VOLi}{SHROUTi}\right)_{NP}\right] - \left[\left(\frac{VOLmk}{SHROUTmk}\right)_{IP} - \left(\frac{VOLmk}{SHROUTmk}\right)_{NP}\right] \qquad (3)$$

Unlike earnings information, which may be released before the annual report, hedging disclosure is available only in the complete annual financial statements. Therefore, investor opinion divergence to hedging information should arise after the release of annual reports. We define the information period as starting with the annual report release date and ending on the

seventh trading day after (7-day window). The normal period includes 40 trading days prior to the annual report release.

We create a dummy variable *SSE*, which equals one if the firm reports only in the SSE, and zero otherwise, to capture reporting opacity.[3] *CFhedge* is an indicator variable that take the value of one if the firm engages in CF hedging, indicated by a non-zero value of CIHEDGE (Compustat), and zero otherwise. As an alternative to *CFhedge* we use *AOCIhedge*, accumulated cash flow hedge gains or losses (Compustat variable AOCIDERGL), scaled by total sales, following Campbell et al. (2021). We expect greater information asymmetry when OCI information is reported opaquely (H1a), that is a positive coefficient on *SSE*. Further, if cash flow hedgers experience higher information asymmetry than non-hedgers (H1b), we would expect a positive coefficient on *CFhedge* and AOCIhedge.

NonSoph, which indicates lower institutional ownership, is included in the model to test whether firms with more unsophisticated investors exhibit higher information asymmetry and the impact of opaque reporting through its interaction with *SSE*. A positive coefficient on the interaction of *CFhedge* and *SSE* and *NonSoph* interacted with *SSE* would be consistent with greater information asymmetry under opaque reporting and would suggest that accounting authorities' arguments that this information is useful to investors were correct (H1c). If manager concerns that increased transparency of OCI items would lead to greater confusion among investors are justified (H1c alternate), then we expect a negative coefficient on the interaction of *CFhedge* and *SSE* and *NonSoph* interacted with *SSE*.

Control variables include *Lmval* (natural log of firm market value), *Big4* (an indicator variable equal to one if the firm is audited by a Big 4 accounting firm that year, and zero

[3] Since IASB issued a similar requirement earlier than FASB, and both IASB and FASB allow early adoption, using the effective time of ASU 2011-05 or any unified cutoff time to distinguish transparency level is not appropriate.

otherwise), *GrowCap* (the future growth rate of real capital expenditure (year 0 to year +1) where real capital expenditure is the reported capital expenditure adjusted by the CPI inflation rate), *Loss* (an indicator variable that takes the value of one if the firm experiences a loss in the year, and zero otherwise), and *Coverage* (the number analysts used to calculate the mean consensus forecast in the IBSE). We also control for earnings surprise (*Surprise*, the difference between current year net income and previous year net income, scaled by price of the previous year) and earnings volatility (*VolEarn),* calculated as the standard deviation of a firm's quarterly earnings over the prior twelve quarters. Only 1134 observations have available data for constructing all control variables. We include industry and year fixed effects and cluster standard errors by firm to control for heteroscedasticity and the potential of serial correlation in errors terms.

4.3 CF Hedging and Firm Value

We hypothesize that CF hedgers exhibit higher firm value in recognition of the benefits of hedging and that after the mandated switch to more transparent reporting the notability of CF hedging is increased (H2a). Alternatively, if managers engage in hedging primarily to reduce their personal risk exposure consistent with Tufano (1996), no value benefit may be associated with CF hedging (H2a alternate). Regardless of the impact of hedging on firm value, we expect OCI volatility will be incorporated in investors' valuation differently when it is reported transparently, negatively impacting firm value (H2b). We test the hypotheses utilizing the following model:

$$Firm\ Value_{i,t} = a + \beta_1 SSE_{i,t} + \beta_2 CFhedge_{i,t} + \beta_3 CFhedge_{i,t}*SSE_{i,t} + \beta_4 VolOCI_{i,t} + \beta_4 VolOCI_{i,t}*SSE_{i,t} + \beta_5 FsaleRatio_{i,t} + \beta_6 Dividend_{i,t} + \beta_7 GrowCap_{i,t} + \beta_8 Leverage_{i,t} + \beta_9 Liquidity_{i,t} + \beta_{10} Size_{i,t} + \beta_{11} Profitability_{i,t} + \varepsilon_{i,t} \quad (4)$$

We measure firm value by the ratio of market value to book value of assets (*MVBA*). To calculate market value of assets, we use market value of equity and add the book value of debt. We use the market value of equity two months after fiscal year end to capture the market valuation after the annual report release since all our sample firms are large accelerate filers (SEC category of filer) and are required to file annual report within 60 days of their fiscal year-end. *CFhedge, SSE, and the interaction of CFhedge and SSE are* our variables of interest for testing hypothesis H2b. *AOCIhedge*, a continuous variable defined previously, is used as the alternative measure of *CFhedge*, to capture the level of hedging results reported.

Earnings volatility can reduce earnings predictability and thus suggests some limitations to firm value consensus. Huang, Lin and Raghundandan (2016) find that OCI volatility is positively associated with audit fees, consistent with higher inherent risk. They also find that OCI volatility has significantly more incremental explanatory power than either the level of OCI or volatility of net income. Following Bao, Billett, Smith and Unlu (2020) we measure the volatility of OCI (*VolOCI*) using the 3-year standard deviation of CI relative to total assets minus the 3-year standard deviation of NI relative to total assets. If managers' concerns regarding increased transparency are justified (H2b), we expect a negative coefficient on *VolOCI*.

Other controls include *FsaleRatio, Dividend, GrowCap, Leverage, Liquidity, Size,* and *ROA (Allayannis and Weston,2001). FsaleRatio* is a measure of multinationality, calculated as the ratio of a firm's foreign sales to total sales. Foreign sales are defined as the firm's non-domestic sales plus the portion of domestic sales that is identified as export. *Dividend* is a dummy variable that equals one if the firm paid a dividend in the current year and zero otherwise. *GrowCap* is as defined previously. *Leverage* is the ratio of total debt over total assets and *Liquidity* as cash and cash equivalents over current liabilities. We measure *Size* using the log of total assets (*Tassets*)

and *ROA*, net income divided by total assets, to control for *Profitability*. 1310 observations have available data for constructing all control variables. We include industry and year fixed effects and cluster standard errors by firm to control for heteroscedasticity and the potential of serial correlation in errors terms.

4.4 FXCF Hedging Participation

Our main purpose is to examine how reporting transparency in OCI affects managerial behavior regarding FXCF hedging. The decision to hedge or not is a participation decision, while how much to hedge is a level decision. We are interested in whether firms change their FXCF hedging practice when forced to report OCI in a more transparent format following ASU 2011-05. We model the probability of a firm engaging in FXCF hedging as a function of reporting transparency, foreign currency cash flow exposure, and other control variables as documented in the literature with the following Probit model:

$$FXCFhedge_{i,t} = a + \beta_1 SSE_{i,t} + \beta_2 FsaleRatio_{i,t} + \beta_3 Dispersion_{i,t} + \beta_4 Imbalance_{i,t} + \beta_5 VolDollar_{i,t} + \beta_6 GrowSale_{i,t} + \beta_7 Leverage_{i,t} + \beta_8 Liquidity_{i,t} + \beta_9 TaxConv_{i,t} + \beta_{10} HHI_{i,t} + \beta_{11} Size_{i,t} + \beta_{12} Manage_{i,t} + \beta_{13} ROA_{i,t} + \beta_{14} OtherHedge_{i,t} + \varepsilon_{i,t} \quad (5)$$

The participation decision (*FXCFhedge*) takes the value of one if the firm engaged in FXCF hedging in the reporting period and zero otherwise. Only firms that reported OCI only within the SSE prior to the reporting mandate have positive values of *SSE*. Based on our hypothesis H3a, we expect a positive relation between *SSE* and *FXCFhedge* indicative of a reduced likelihood of FXCF hedging when these firms are required to report the unrealized gains and losses from FXCF hedging in a more transparent format.

We measure the level of currency cash flow exposure using foreign sales ratio *(FsaleRatio*), geographic dispersion (*Dispersion*), the degree to which a firm is *imbalanced* in terms of foreign

revenues and foreign expenses (*Imbalance*), and recent dollar volatility (*VolDollar*). *FsaleRatio* is as previously defined. *Dispersion* is the entropy measure employed by Guay and Kothari (2003) that should capture the multidimensional nature of geographic dispersion. It is calculated as $\Sigma A_i \ln(1/A_i)$, where A_i is the ratio of unit *i*'s foreign sales to the firm's total sales, suggesting the importance of each unit. *Imbalance* is the absolute value of the difference between a firm's foreign sales ratio and foreign assets ratio (Richie et al. 2006). The foreign asset ratio is identifiable non-domestic assets to total assets. For firms missing this item, we use non-domestic long-lived assets or non-domestic plant, property, and equipment (PPE) in which case total long-lived assets or PPE is used for scaling. For each financial statement date, we calculate exchange rate volatility (*VolDollar*) as the standard deviation of the monthly trade-weighted U.S. Dollar index (broad, monthly) from Federal Reserve Economic Data (FRED) for the previous five years.

Firm characteristics shown in prior literature to be related to the hedging decision include a proxy for growth *(GrowSale)*, *Leverage*, *Liquidity*, income tax convexity (*TaxConv*), industry competitiveness (*HHI*), profitability *(ROA)* and *Size*. *GrowSale*, *Leverage*, *Liquidity*, and *ROA* are as previously defined. *TaxConv* is an indicator variable equal to one if a firm has positive net income and non-zero NOL tax carryforwards in a year, and zero otherwise (Nance, Smith, and Smithson 1993). Following the prior literature, we use the Herfindahl-Herschmann index, *HHI*, to measure industry competition. *HHI* is calculated by summing the squared market share of each firm competing in the industry, as classified by two-digit SIC code. Higher values of *HHI* indicate firms with lower industry competition and thus potentially higher pricing power. We measure *Size* using either 1) the log of total assets (*Tassets*) or 2) log of total employees (*Employees*). 1267 observations have available data for constructing all control variables.

Managers' private exposure and risk aversion (*Manage*) may contribute to hedging practice choices, as suggested by Tufano (1996). We use three proxies for *Manage*: the degree of earnings smoothing, CEO equity-based incentives, and job security. If managers are concerned that volatile corporate earnings will impact shareholder assessments of their performance, they may engage in earnings smoothing and be similarly motivated to reduce future volatility through hedging. Therefore, the presence of a high degree of earnings smoothing suggests managers that are more likely to be concerned about shareholder evaluations of volatility and engage in hedging to reduce their personal risk exposure. We follow Kothari, Leone and Wasley (2005) by computing the modified Jones-model discretionary accrual controlling for profit (*ROA*). Given that upward earnings management and downward earnings management may be motivated for different reasons, we split *DA* into positive and negative values to isolate the effect of upward versus downward earnings management on hedging. We examine *DA* by quartiles and define the upper quartile as high positive earnings management (*HP*) and the lowest quartile as negative earnings management (*HN*). *HP* equals *DA* if a firm abnormally manages its earnings upward (*DA* is in the upper quartile, extreme end of positive discretionary accruals), zero otherwise; similarly, *HN* equals *DA* if a firm abnormally manages its earnings downward (*DA* is in the lowest quartile, extreme end of negative discretionary accruals), and zero otherwise. To avoid the possibility that the extreme observations of *DA* distort our results, we winsorize *HP* and *HN* at the first and 99^{th} percentile.

Our second proxy for managers' private exposure, *Manage*, is CEO equity-based incentives. Managers with greater private exposure are incentivized to manage cash flow risk at the corporate level where the cost of risk management is borne by their companies. Following Bamber et al. (2010), we measure CEO equity-based incentives (*EquityInc*) as the sensitivity of

the CEO's stock and stock option holdings to a change in stock price, calculated as the effect of a one percentage point increase in the firm's stock price on CEO's equity holding (1pct) scaled by total annual compensation (1pct + cash salary + bonus). Our third proxy for managerial risk aversion (*Manage*) is a measure of job security, *Jsecurity*, proxied by the sum of two indicator variables: CEO-chair duality and insider-dominated board. Therefore, *Jsecurity* takes a value of zero, one, or two. Due to the missing data, we lose about one-third of our observation when *EquityInc* and *Jsecurity* are used in alternative specifications.

Almost half of the firms in our sample with foreign currency exposure do not choose to participate FXCF hedging, and 60 percent of those firms do not participate any type of hedging activity. Accordingly, the 46 percent of zeros we observe for *FXCFhedge* are structural, possibly representing different meanings. It could be that managers are restricted from hedging by firm policies, or that they choose not to hedge future currency cash flow exposure in some periods due to macroeconomic and/or firm specific reasons. If a firm engages in other types of hedging activities, then we can assume they have no policy restriction on hedging activities. Therefore, we include a proxy for firm hedging practice, *OtherHedge*, which equals one if a firm engages in non-currency hedges, commodity hedging or interest rate hedging, and zero otherwise. We include industry and year fixed effects to control for differences in hedging activities between industries as well for macroeconomic variations. We also cluster standard errors at the firm level to control for heteroscedasticity and serial dependence.

4.5 FXCF Hedging Level Decision

To test H3b, we examine whether the prominence of OCI reporting affects the level of FXCF hedging following increased transparency. At this stage, sample firms will be limited to those firms already choosing to hedge, FXCF hedgers. We could have a self-selection problem as firms

may self-select to become a hedger for reasons both observed and unobserved. To address the potential for unobserved factors that affect the hedging choice, we use Heckman correction, that is, including the inverse mill ratio (*IMR*), calculated from the first stage Probit regression, Equation (5), into the second stage OLS regression. *OtherHedge* serves as our exclusion variable because it influences a firm's decision to participate in FXCF hedging but does not have any impact on the level of FXCF hedging if the firm does choose to engage in FXCF hedging.

$$FXCFdegree_{i,t} = a + \beta_1 SSE_{i,t} + \beta_2 VolHedGL_{i,t} + \beta_3 VolHedGL{*}SSE_{i,t} + \beta_4 FsaleRatio_{i,t} + \beta_5 Dispersion_{i,t} + \beta_6 Imbalance_{i,t} + \beta_7 VolDollar_{i,t} + \beta_8 GrowSale_{i,t} + \beta_9 Leverage_{i,t} + \beta_{10} Liquidity_{i,t} + \beta_{11} TaxConv_{i,t} + \beta_{12} HHI_{i,t} + \beta_{13} Size_{i,t}\ \beta_{14} Manage_{i,t} + \beta_{15} IMR_{i,t} + \varepsilon_{i,t} \quad (6)$$

The degree of FXCF hedging (*FXCFdegree*) is the notional value of all outstanding contractual FXCF hedges, scaled by the firm's foreign gross profit. We use foreign gross profit as the scalar since the foreign cash flows protected by FXCF hedging can be either foreign sales or costs. For firms that report notional values only in foreign currency, we convert the amounts into US dollars based on the exchange rate in effect at the reporting date. For firms reporting notional value aggregately for different types of hedges, we cannot get the actual value for constructing *FXCFdegree.* While we must treat these observations as missing for *FXCFdegree,* we still assign a value of one for *FXCFhedge* if it is evident that the firm engaged in FXCF hedging activities in that period. Final sample of FXCF hedgers with actual data for computing *FXCFdegree* consists of 436 observations We expect a positive relation between *SSE* and *FXCFdegree* if firms previously reporting OCI items only within the SSE reduce the level of FXCF hedging after the mandated reporting change (H3b).

As outlined in the development of Hypothesis H3c, we expect managers of firms with high volatility of OCI items in the past to be those motivated to reduce FXCF hedging when

transparency is mandated. To test this hypothesis, we include past volatility of reported unrealized cash flow hedging gain or loss relative to the 3-year standard deviation of net income (*VolHedGL*) and its interaction with *SSE*. Other variables are as previously described. Again, we control for industry and year fixed effect and cluster standard errors at the firm level.

We provide a summary of our variables, their description, and source in the Appendix 1.

5. RESULTS

5.1 Descriptive Statistics

Table 1.1 provides a full set of descriptive statistics for our Exposed sample of 244 firms (1,310 firm-year observations). Eighty-two percent of our sample firms reported opaquely before ASU 2011-05 and were forced into more transparent reporting of OCI, resulting in 386 firm-year observations have a valuing of one for *SSE*. These observations represent 29.5 percent of total firm-year observations for our sample, indicated by the mean value of *SSE* in Table 1.1. We observe 68.5 percent of firm-year observations (62.3 percent of firms) engage in some type of CF hedging, with 50.6 percent of firm-year observations (52.5 percent of firms) engaging in FXCF hedging, which constitutes our FXCF Hedger subsample.

[Insert Table 1.1 here]

5.2 Reporting Transparency and CF Hedging on Information Asymmetry

Previous research shows that increasing information content should reduce information asymmetry, all other things being equal. However, in our setting the information content has not changed – only the reporting location has changed. Therefore, we are interested if any reduction in information asymmetry occurred as measured by the investor opinion divergence, spread (*Spread*) or abnormal trading volumes (*abVol*). Table 1.2 presents the results of Equation (1) testing of H1a through H1c.

[Insert Table 1.2 about here]

In Table 1.2 column (1), we find some evidence that investors experience a higher level of information asymmetry when OCI is reported opaquely as suggested by the positive and significant coefficient on *SSE*. That is, transparent reporting helps reduce investor opinion divergence when proxied by *Spread*, supporting H1a. The significant positive coefficient on CF hedging suggests that hedging activities bring about complexity in financial reporting thereby introducing more divergence among investors, regardless of reporting location, supporting H1b.

Less sophisticated investors are likely to miss information previously buried in the SSE in contrast to their institutional investor counterparts. We find evidence that firms with higher percentage of non-institutional investors (*NonSoph*) exhibit greater investor opinion divergence. That is, although ASU 2011-05 successfully increased the information transparency for overall market participants, a greater presence of non-sophisticated investors still contributes to investor divergence.

In the second column, we isolate the impact of IS format further by adding an IS indicator variable that takes the value of one when OCI and CI are reported on the face of the IS and zero otherwise. The result shows that IS, one of two transparent reporting formats, brings about an impact on investors divergency indifferent from SCI format.

In tests not reported in Table 1.2, we split *CFhedge* into *CFhedgeGain* and *CFhedgeLoss* to determine whether the investor divergence associated with CF hedging is driven by sensitivity to reporting hedging losses. *CFhedgeGain* and *CFhedgeLoss*, equal to one when CF hedgers report gains and losses, respectively, in that fiscal year and zero otherwise. According to Koonce et al. (2005) investors are more sensitive to negative information. If investors are confused by the expected relationship between CF hedging losses and future profits, we expect firms reporting

CF hedging losses to have higher levels of investor confusion (or diverging opinions). We find investor divergence related to hedging losses is positive and significant, however, investor divergence is not exclusive to losses. While there is still evidence of greater investor divergence associated with non-institutional investors, there is no evidence that it is attributable to CF hedging results specifically.

In column (3), we replace the dummy *CFhedge* in column (1) with the continuous measure *AOCIhedge*. Although this is not a clean measure for CF hedging degree, it should contain more information than just an indicator variable. Since firms can have positive values (gains), negative values (losses), or a value of zero (in the case of non-hedgers), we employ the absolute value of this variable. We find that the investor divergence associated with CF hedging is greater when CF hedging results are reported opaquely. When CF hedging information is reported more prominently, the divergence is eliminated. This finding suggests that the accounting authorities were correct that transparent reporting helps reduce information asymmetry, in partial support of H1c.

In column (4) to (6), we use abnormal trading volume (*abVol*) as the alternative measurer of investor opinion divergence. Although the overall impact of *SSE* is no longer significant, the significantly positive coefficients on *CFhedge*SSE* in columns (4) and (5) and *AOCIhedge*SSE* in column (6) suggest that the information asymmetry associated with CF hedging is higher under opaque reporting. There is no evidence that a greater presence of non-institutional investors contributes to greater information asymmetry using this alternative measure of opinion divergence.

We similarly split *AOCIhedge* into *AOCIhedgeGain* (positive values of AOCIDERGL and zero otherwise) and *AOCIhedgeLoss* (absolute value of negative values to simplify interpretation

and zero otherwise). Though we do not include the results here, we find a reduction in investor divergence following transparent reporting. The evidence suggests that, when reported opaquely, hedging losses trigger more investor divergence than gains, consistent with prior research that investors pay more attention to losses than gains in processing financial information. This is consistent with the positive and significant coefficient on *Loss* in regressions where *Spread* is the dependent variable. The results further support H1c, that the accounting authorities were correct in mandating this information be reported more transparently.

In summary, our results show that CF hedging leads to investor opinion divergence when the information is reported opaquely. Transparent reporting helps reduce the information asymmetry surrounding CF hedging activities. Hence, the accounting authorities were correct in that prominent OCI disclosure helps promote information transparency thereby reducing investor divergence rather than amplifying. We find limited evidence that non-sophisticated investors may be confused by complex hedging information when it becomes more visible. Thus, we do not find sufficient evidence to support managers' belief that this information would lead to investor confusion. We find some evidence that the information asymmetry associated with CF hedging is mainly attributed to reported hedging losses rather than gains.

5.3 Impact of Change in Statement Location and FXCF Hedging on Firm Value

Column (1) of Table 1.3 presents the result of Equation (4) with firm value (*MVBA*) as the dependent variable. CF hedging does not appear to be value-enhancing, but OCI volatility significantly discounts firm value when reported transparently as expected, suggested by the significant coefficient on *VolOCI*. However, the positive coefficient on the interaction of SSE and *VolOCI* indicates that firms reported in opaque format was able to avoid such valuation penalty associated with OCI volatility. The significant coefficient on *SSE* appears to suggest a

value premium related to opaque reporting. We believe that it is the result of management exploitation of investor inattention to value relevant information previously reported less saliently. The change in reporting location increased the prominence of OCI information, thereby increasing investors' attention. Therefore, the observed premium associated with opaque reporting should be the result of the reduced the visibility of reported OCI information. The insignificant sum of coefficients of *VolOCI* and *VolOCI*SSE* suggests there may not be a value "premium" associated with opaque reporting as appeared but a detrimental impact of OCI volatility when reported in transparent formats, either SCI or IS. When reported opaquely, OCI volatility was buried and not impounded by investors in their valuation. When investors are more aware of OCI volatility, they tend to increase their risk assessment and lower firm value. These results are consistent with managers' concerns about investor confusion regarding OCI and the prevalence of manager opposition to reporting OCI prominently, supporting H2b. As suggested by Huang et al (2021), investor incorporate OCI information in their valuation to a further extent when a single IS is presented. Therefore, in order to test whether the effect is mainly driven by the IS sample, we run the same regression on the sample excluding observations associated with IS reporting and result remains qualitatively the same (Column (2)).

[Insert Table 1.3 about here]

CF hedging appears not to be recognized when dummy *CFhedge* is used in the first two columns as both coefficients on *CFhedge* and its interaction with *SSE* are insignificant. However, we find some evidence that investors value CF hedging when we replace dummy *CFhedge* with the continuous variable *AOCIhedge* in column (3). Positive coefficient on *AOCIhedge* suggests that investors recognized the potential benefits of CF hedging when it is reported prominently. Such value implication is not significantly lower when reported opaquely

(insignificant of *AOCIhedge*SSE* interaction). Since we believe the continuous measure captures more information about CF hedging and is often used as the proxy for the degree of hedging in the literature, we interpret the result as investors appreciating risk management practices aimed at reducing cash flow volatility and supporting the first half of H2a but not the second part.

We note that AOCIDERGL includes unrealized gains and losses from all cash flow hedging activities rather than just those related to foreign currency cash flow hedges. Since we focus on FX hedging in the current study and the sample includes only firms with FX exposure, we replace *CFhedge* with *FXCFhedge*, an indicator variable that takes the value of one for engaging in foreign currency CF hedging and zero otherwise, in column (4). The result suggests that investors are capable of recognizing FXCF hedging benefits.

In summary, we find robust evidence that the volatility of reported OCI is detrimental to firm value when OCI is reported transparently, and that firms lose the premium associated with opaque reporting that previously might have shielded volatile OCI. The findings justify managers concern over the downside of prominent OCI reporting. However, we find no evidence to support differences in investor valuations of hedging results due to the change in reporting location. Our results provide limited evidence that investors value CF hedging, especially FXCF hedging, as a tool of firm's risk management but there is no evidence that transparent reporting increased this value premium.

In order to control for time invariant firm characteristics more stringently, we utilize a difference-in-difference (DID) model, following Gilje and Taillard (2017), as an alternative method to provide a supplemental test of H2. We identify 200 firms that previously reported OCI in SSE format and switch to transparent formats upon the ASU implementation. These firms, Changer, are considered treated sample in that they are impacted by ASU 2011-05, while the rest

of 44 firms that always report in transparent formats are not impacted by ASU 2011-05, therefore are used as control sample. We estimate the following DID model to test the effect of ASU 2011-05 on firm valuation.

$$Firm\ Value_{i,t} = a + \beta_1 Changer_i + \beta_2 Pre_t + \beta_3 Changer_i * Pre_t + \beta_4 CFhedge_{i,t} + \beta_5 FirmFE_i + \varepsilon_{i,t} \quad (7)$$

Changer is an indicator variable equal to one for firms that switch reporting format upon ASU 2011-05 and zero for firms always report transparently. Since all firms are required to report OCI in a transparent format in the post-ASU period, Changer firms only differ from the control firms in the pre_ASU period. We create an indicator variable *Pre*, equal to one for the years before Changer firms switched from SSE to SCI or IS and zero for the year of switch and the years after the switch. For control firms, *Pre* is equal to one for the years prior to the effective date of ASU 2011-05 and zero for the years after the effective date. Firm fixed effects are included to control for the time invariant firm characteristics. Results are presented in Table 1.4.

[Insert Table 1.4 about here]

In column (1), we do not find overall effect of ASU on Changer firms' value. However, when we subdivide sample based on OCI volatility, we find significant evidence of H2a. In column (2), we test the subgroup of firms with above median OCI volatility (*HighVolOCI*=1), and find that control firms, who reported OCI transparently in the pre-ASU period, are valued significantly lower by the market. The interaction coefficient, *Changer*Pre*, is positive but the sum of the coefficients of *Pre* and interaction is not significant (*p*-value =0.7587), suggesting that Changer firms avoided such detrimental impact by reporting OCI opaquely in the pre-ASU period. While firms with relatively low OCI volatility, in column (3), we do not observe such impact. To formally test whether transparent reporting impact firm valuation differently based on

OCI volatility, we perform a triple differencing specification in column (4). The triple interaction coefficient, *Changer*Pre*HighVolOCI*, is significantly positive, canceling out the detrimental impact suffered by firms with high OCI volatility in the pre-ASU period (the sum of coefficients of *Pre*HighVolOCI* and the triple interaction is insignificant). The results imply that firms with high OCI volatility were penalized if they displayed such volatile OCI prominently while opaque reporting could help them avoid such penalty in the pre-ASU period. This is consistent with what we find in Table 1.3 and is supportive of H2b. We also find that investors recognized the hedging benefit but only when OCI volatility is relatively low, consistent with what we find in Table 1.3.

5.4 FXCF hedging practice and Univariate results

Table 1.5 Panel A provides a summary of CF hedging practice by year. Among 244 firms with FX exposure during our sample period, 52 percent (128 firms) engage in FXCF hedging at some time, while less than 30 percent of firms (72 firms) participate in other types of CF hedging (commodity and/or interest rate hedging) but not FXCF hedging. There are 92 firms, 24 percent of the sample, that never engage in any type of CF hedging (FXCF or other). The portion of Exposed firms that hedge FX cash flows slightly drops in years after ASU 2011-05, preliminary evidence that firms reduce FXCF hedging activities in response to the increase in OCI reporting transparency.

[Insert Table 1.5 about here]

Since we focus on FXCF hedging in this study, in Panel B we segregate FXCF hedgers from non-FXCF hedgers to preliminarily examine the differences across these subsamples. The FXCF hedger sample is limited to 436 observations with available data to construct *FXCFdegree* and other variables. It is evident that FXCF hedgers face greater foreign currency risk, as measured

by the foreign sales ratio, geographic dispersion and imbalance of foreign sales and foreign assets. This suggests that FXCF hedging is mainly driven by FXCF exposure.

FXCF hedgers tend to be highly levered, less liquid, and more likely to enjoy tax benefits (*TaxConv*), indicating the motivations for hedging. We observe a higher pricing power (*HHI*) among FXCF hedgers, inconsistent with the expectation that firms are more likely to engage in CF hedging when they face fierce competition and have less ability to pass through exchange rate changes to customers. Firms that engage in FXCF hedging are more likely to have the resources and structure to support hedging as they are typically larger (*Tassets* and *Employees*) and more likely to engage in any other types of hedging (*OtherHedge*), including other non-FX cash flow hedges, fair value hedges, net investment hedges, or non-designated hedges. CEOs of FXCF hedgers have significantly lower equity compensation, consistent with the finding of Bamber et al. (2010) that managers whose wealth is more sensitive to investor valuation are more motivated to reduce the perceived volatility of firm performance bought about by OCI reporting.

5.5 Choice of FXCF hedging – Probit results

We report the likelihood of engaging in FXCF hedging using Equation (5) in Table 1.6 column (1) with total assets (*Tassets*) as our proxy for firm size and earnings smoothing measures (*HP* and *HN*) as our proxy for managerial motivations. Again, we lose some observations due to missing data in control variables. In column (2), we use *Employees* as our proxy for firm size. In column (3) and column (4), we use *EquityInc* and *Jsecurity*, respectively, as our proxies for managerial motivations although missing data reduces our observations significantly in these results.

[Insert Table 1.6 about here]

Overall, our results show that the likelihood of engaging in FXCF hedging is significantly higher in pre-ASU period, evidenced by significantly positive coefficients on *SSE*. This implies that firms reduce the use of FXCF hedging in response to the mandated increase in reporting transparency, consistent with H3a and management concerns when hedging results are more visible. According to our findings in the previous sections, CF hedging contributes to investor divergence and the volatility of OCI which is detrimental to firm value. In this sense, it might appear reasonable for managers to adjust FXCF hedging to reduce investor divergence and the potential valuation penalty from OCI volatility. However, since we find weak evidence that investors value CF hedging and that impact is insensitive to reporting location and hedging results, any decision to reduce the use of FXCF hedging may be inconsistent with shareholder wealth maximization.

Firms are more likely to engage in FXCF hedging the greater their foreign currency exposure as measured by *FsaleRatio*, *Dispersion*, and *Imbalance*, consistent with previous research findings. Our results show that FXCF hedgers are larger and more likely to enjoy tax benefits (*TaxConv*). Unlike in the univariate comparison, *HHI* is insignificant here, suggesting that the pricing power may not contribute to the decision to hedge FXCF. Size could reflect a firm's access to the personnel necessary to manage an active hedging program, as the literature suggests. Our results hold when we replace total assets with total number of employees as our measure of size in columns (2) through (4). We do not find consistent evidence that managerial risk aversion motivates firms' CF hedging decision. nor private exposure

Overall, firms that engage in other types of hedging are more likely to engage in FXCF hedging as well, suggesting firms that select hedging have the resources and structure to support hedging activities. FXCF hedgers may also tend to have higher short-term liquidity, but the result

is not robust across specifications. While the FXCF hedging decision is unaffected by earning smoothing activities, firms with higher levels of CEO equity-based incentives are less likely to engage in FXCF hedging, consistent with our univariate result in Table 1.4. In column (4), CEO job security does not appear to influence the FXCF hedging choice.

5.6 Degree of FXCF Hedging – OLS Results

FXCFdegree captures the total notional value of FXCF hedges, divided by the firm's level of foreign gross profits. As discussed in the previous section, we include the *IMR* calculated from the Probit regression (6) to correct for potential self-selection bias and any related omitted variable issue. *OtherHedge* serves as our exclusion variable here as the first stage Probit regression results show that it is a significant determinant in hedging participation decision but should not be related to the level of FXCF hedging. Column (1) of Table 1.7 reports the result of our test of *FXCFdegree* using Equation (6), on only firms that engage in FXCF hedging (*FXCFhedge*=1).

[Insert Table 1.7 about here]

We do not find evidence that firms overall reduce their FXCF hedging level when hedging results are disclosed more transparently. However, hypothesis H3c is supported when we focus on the group of firms that previously experienced the highest volatility (*HighVol*). *HighVol* firms reduce their degree of FXCF hedging after the mandated switch to transparent reporting. This is consistent with opaque preferring firms, especially those with prior high volatility in OCI items, reducing their hedging level to minimize what they believe to be a potential source of investor distraction if reported transparently. Although not reported in our results, univariate tests of differences in OCI volatility across reporting location confirm that previously opaque firms did reduce OCI volatility when forced to report more transparently.

We find evidence that firms that engage in positive earnings smoothing hedge more, as evidenced by the significant coefficients on *HP*. We expect firms that engage in earnings smoothing to be firms that are most concerned about meeting forecasted earnings targets. Given a firm already engages in FXCF hedging, firms that are most sensitive to meeting investor expectations are more likely to protect future performance with higher levels of risk management. However, it appears that CEO equity compensation and job security do not have a significant impact on the level decision. After controlling for other factors related to the FXCF hedging decision, we find that firm with higher pricing power hedge less, consistent with Campbell (2015). There is also evidence suggesting larger firms tend to hedge more.

As we discussed in the previous sections, the change in hedging level may not be justified as we find no evidence of additional information asymmetry associated with CF hedging after switching to transparent reporting. Furthermore, we show weak evidence that firm value is positively related to CF hedging degree proxied by absolute value of unrealized hedging gains and losses. Nevertheless, managers appear to reduce participation in and the level of FXCF hedging as a means of reducing OCI volatility despite any benefits of foreign currency hedging. Although beyond the scope of this paper, it is possible that firms shift to methods of currency exposure management that do not have OCI implications, such as operational hedging.

5.7 Robustness Checks

Since prior study suggests that OCI is only value relevant after ASU 2011-05, regardless of the prior reporting format (Kim 2017), we use an alternative model, replacing *SSE* with *ASU* (equal to one for the firm-year after the effective date of ASU 2011-05 and zero otherwise). Results are qualitatively similar to what we discussed in the section 5.3. Greater volatility in OCI was not detrimental to firm value when OCI is reported opaquely in the pre-ASU period, but it damages

firm value in the post-ASU period, justifying management's concern over prominent OCI reporting and their reduction in FXCF hedging.

To assess whether our results are sensitive to a particular measure of our key variables, we conduct our tests utilizing various alternative variables. As an alternative measure for the FXCF hedging level, we scale the notional value of FXCF hedges by foreign sales rather than foreign gross profit. Although we believe most firms hedge their foreign sales exposure net of foreign costs, foreign cost data is hard to estimate while foreign sales information is more readily available. Bodnar, Hayt, Marston, and Smithson (1995) provide empirical evidence that firms only partially hedge their foreign currency exposure, so it is possible that firms decide their hedging level based on a certain percentage of foreign sales. Although not reported in our results, our findings regarding FXCF hedging levels hold under this alternative specification.

For our key independent variables, we employ several alternative specifications. As already mentioned, we use two different *Size* measures, the number of employees and total assets, and three measures of managerial motivations – earnings smoothing, equity incentives and job security. We use performance-matched discretionary accruals (controlling for profit in modified Jones model) to construct alternative measures of earnings management (*HP* and *HN*). Our main results are robust to each of these alternative specifications.

Our findings are based on a sample of firms for whom the statement transparency mandate represents an exogenous shock. To address potential self-selection bias and any omitted variable problems related to the decision to hedge, we use the Heckman two-stage procedure and include the inverse Mills ratio in our model of the hedging level decision.

Our sample of S&P 500 firms includes both financial institutions and utilities. In results not reported, we exclude these firm types and our results are consistent. There are limitations that

our results might only hold for S&P 500 firms. Some of our results do indicate that FXCF hedging activity is more likely among larger and more profitable firms. We believe that value relevance may also be greater for S&P 500 firms since firm visibility is higher. Our results should hold for comparable firms that have similar currency exposure, size, and visibility. Our findings suggest that the FXCF hedging decision is driven by both the motivation and means to minimize the impact of unrealized hedging gain or loss on comprehensive income. Therefore, our results may not apply to much smaller firms, with limited foreign sales or sophisticated personnel to handle hedging transactions, and those not actively traded by nonprofessional investors.

6. CONCLUSION

Our first contribution comes from whether the change in statement location benefitted investors by reducing information asymmetry surrounding CF hedging activities. Our results confirm that accounting authorities were correct in that prominent OCI disclosure helps promote information transparency, reducing investor divergence rather than amplifying. We find limited evidence that non-sophisticated investors may be confused by complex hedging information when it becomes more visible. Thus, we do not find sufficient evidence to support managers' belief that this information would lead to investor confusion.

Our second contribution is the impact of transparent reporting of cash flow hedging results on firm value. We find evidence firms enjoyed higher valuations when OCI was previously reported only in the SSE, consistent with the implications of limited attention and processing power modeled by Hirshleifer and Teoh (2003). When these firms are forced to report transparently, volatility of reported OCI is negatively associated with firm value, justifying managers opposition to ASU 2011-05. However, we find no evidence to support differences in

investor valuations of hedging results due to the change in reporting location. While our results provide some evidence that investors value a firm's efforts to manage risk, there is no evidence that transparent reporting increased this value premium.

We examine whether the increased transparency of unrealized cash flow hedge gains and losses in a separate statement resulted in a change in hedging behavior. The implementation of ASU 2011-05 provides an external shock where firms that preferred opaque reporting were forced to increase the prominence of their OCI reporting. We find evidence that increased transparency resulted in a reduced likelihood of using FXCF hedging. Our results also show a reduced level of FXCF hedging following reporting in a more transparent format among firms with the greatest volatility of cash flow hedging gains and losses before the mandated statement change. These findings are consistent with comment letters suggesting that some managers feared additional transparency would only confuse users.

Although CF hedging is generally viewed as a value enhancing activities regardless of reporting location, we only find weak evidence to support this hypothesis. On the other hand, we find strong evidence that investors lower their valuations in the presence of OCI volatility. Since CF hedges increase OCI volatility, this suggests a possible trade-off. Managers appear to choose to reduce the use of FXCF hedging to reduce the volatility of OCI once they lose the option to limit the visibility of this information. While our results are consistent with concerns expressed by managers prior to the implementation of ASU 2011-05, managers' actions to reduce FXCF hedging may not be consistent with shareholder wealth maximization.

Table 1.1 Summary Statistics

	N	Mean	Min	p25	Median	p75	Max
Spread	1134	.309	.053	.152	.232	.360	1.907
abVol	1134	.437	-13.509	-1.668	.048	1.911	19.675
MVBA	1310	2.241	.788	1.472	1.907	2.548	13.027
FXCFhedge	1310	.506	0	0	1	1	1
FXCFdegree	436	.375	.001	.099	.265	.499	5.070
SSE	1310	.295	0	0	0	1	1
CFhedge	1310	.685	0	0	1	1	1
AOCIhedge	1310	12.910	0	0	3.690	16.488	98.578
FsaleRatio	1310	.429	.003	.240	.414	.614	.990
Dispersion	1310	.702	.019	.358	.650	.94	2.255
Imbalance	1153	.155	0	.034	.097	.231	.849
VolDollar	1310	.837	.367	.538	.622	1.136	2.288
VolHedGL	1299	.170	0	0	.022	.119	12.083
HighVol	1310	.283	0	0	0	1	1
Lmval	1310	9.257	6.402	8.669	9.202	9.812	11.343
Big4	1304	.992	0	1	1	1	1
GrowCap	1310	.132	-.812	-.097	.066	.250	5.700
Loss	1134	.053	0	0	0	0	1
Coverage	1134	14.332	1	10	14	18	38
Surprise	1134	.009	-.583	-.005	.005	.016	1.568
VolEarn	1134	.013	.001	.004	.008	.014	.153
NonSoph	1134	.306	0	0	0	1	1
VolOCI	1310	2.131	.097	.990	1.217	2.181	48.173
Dividend	1310	.737	0	0	1	1	1
Leverage	1310	.238	0	.130	.227	.325	.793
Liquidity	1310	.879	.013	.244	.548	1.078	8.208
Tassets	1310	8.962	6.515	8.328	8.892	9.554	11.705
ROA	1310	.077	-.264	.044	.075	.113	.361
GrowSale	1288	.051	-.814	-.016	.044	.113	1.242
TaxConv	1310	.674	0	0	1	1	1
HHI	1310	.119	.027	.052	.075	.129	.471
Employees	1308	2.819	-.246	1.991	2.773	3.639	6.290
HP	1310	.012	0	0	0	.018	.129
HN	1310	-.011	-.097	0	0	0	0
EquityInc	890	.187	.001	.075	.127	.208	1
Jsecurity	901	1.396	0	1	1	2	2
OtherHedge	1310	.545	0	0	1	1	1

Notes: Table 1.1 presents summary statistics for our Exposed Sample, which includes S&P 500 firms with fiscal years ending from 2010 to 2015 representing 244 firms with foreign currency exposure across the effective date of ASU 2011-05 and available data for constructing most dependent variables. All variables are described in Appendix 1.

Table 1.2 Information Asymmetry

$$Information\ Asymmetry_{i,t} = a + \beta_1 SSE_{i,t} + \beta_2 CFHedge_{i,t} + \beta_3 CFHedge_{i,t}*SSE_{i,t} + \beta_4 NonSoph_{i,t} + \beta_5 NonSoph_{i,t}*SSE_{i,t} + \beta_6 Lmval_{i,t} + \beta_7 Big4_{i,t} + \beta_8 GrowCap_{i,t} + \beta_9 Loss_{i,t} + \beta_{10} Coverage_{i,t} + \beta_{11} Surprise_{i,t} + \beta_{12} VolEarn_{i,t} + \varepsilon_{i,t} \quad (1)$$

	(1)	(2)	(3)	(4)	(5)	(6)
	Spread	*Spread*	*Spread*	*abVOL*	*abVOL*	*abVOL*
SSE	0.066*	0.059*	0.053*	-0.901	-0.922	-0.930
	(0.034)	(0.035)	(0.027)	(0.606)	(0.631)	(0.602)
IS		-0.026			-1.947	
		(0.052)			(1.371)	
CFhedge	0.054**	0.055**		-0.374	-0.472	
	(0.024)	(0.025)		(0.452)	(0.468)	
*CFhedge*SSE*	0.019	0.018		1.002*	1.111*	
	(0.036)	(0.035)		(0.557)	(0.584)	
*CFhedge*IS*		-0.060			1.383	
		(0.048)			(1.315)	
AOCIhedge			0.000			-0.159
			(0.004)			(0.100)
*AOCIhedge*SSE*			0.014*			0.354**
			(0.008)			(0.148)
NonSoph	0.047*	0.049*	0.042**	-0.400	-0.428	-0.405
	(0.028)	(0.029)	(0.018)	(0.392)	(0.412)	(0.632)
*NonSoph*SSE*	-0.032	-0.033	-0.027	0.143	0.165	0.179
	(0.033)	(0.034)	(0.031)	(0.505)	(0.505)	(0.629)
*NonSoph*IS*		-0.013			0.943	
		(0.046)			(1.468)	
Lmval	-0.113***	-0.117***	-0.107***	-0.079	-0.087	-0.053
	(0.017)	(0.017)	(0.010)	(0.216)	(0.205)	(0.391)
Big4	0.001	0.012	0.000	-1.008*	-0.833	-0.961*
	(0.035)	(0.036)	(0.080)	(0.564)	(0.676)	(0.565)
GrowCap	0.008	0.008	0.004	0.163	0.156	0.126
	(0.026)	(0.026)	(0.016)	(0.405)	(0.405)	(0.370)
Loss	0.204***	0.199***	0.204***	0.214	0.171	0.259
	(0.071)	(0.070)	(0.032)	(1.171)	(1.169)	(1.224)
Coverage	0.003	0.003	0.003	-0.056*	-0.056*	-0.055
	(0.002)	(0.002)	(0.002)	(0.033)	(0.034)	(0.044)
Surprise	0.123	0.121	0.124	-3.043	-3.067	-2.960
	(0.129)	(0.129)	(0.129)	(2.917)	(2.921)	(2.650)
VolEarn	2.898***	2.917***	2.763***	-0.034	0.690	-0.083
	(0.945)	(0.970)	(0.417)	(8.097)	(7.904)	(10.406)
Industry/Year	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1134	1134	1134	1134	1134	1134
R^2	0.313	0.316	0.307	0.115	0.116	0.117

***Notes*:** Table 1.2 presents the results of Equation (1) with measures of information asymmetry as the dependent variable. Information asymmetry is measured by bid-ask spread (*Spread*) in columns (1) - (3) and by abnormal trading volume (*abVol*) in column (4) to (6). The independent variable of interest, CF hedging, is measured by dummy variables *CFhedge* and by continuous variables *AOCIhedge*. All other variables are described in Appendix 1. Only 1134 observations with non-missing data for all control variables are included. Standard errors (clustered at the firm level) are in parentheses. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 1.3 Firm Value

$$Firm\ Value_{i,t} = a + \beta_1 SSE_{i,t} + \beta_2 CFhedge_{i,t} * SSE_{i,t} + \beta_3 VolOCI_{i,t} + \beta_4 FsaleRatio_{i,t} + \beta_5 Dividend_{i,t} \beta_6 GrowCap_{i,t} + \beta_7 Leverage_{i,t} + \beta_8 Liquidity_{i,t} + \beta_9 Size_{i,t} + \beta_{10} Profitability_{i,t} + \varepsilon_{i,t} \quad (4)$$

	(1)	(2)	(3)	(4)
SSE	0.378***	0.385***	0.206**	0.265***
	(0.135)	(0.139)	(0.083)	(0.097)
CFhedge	0.100	0.151*		
	(0.080)	(0.087)		
*CFhedge*SSE*	-0.249	-0.204		
	(0.161)	(0.144)		
AOCIhedge			0.040**	
			(0.016)	
*AOCIhedge*SSE*			-0.010	
			(0.032)	
FXCFhedge				0.118*
				(0.069)
*FXCFhedge*SSE*				-0.165
				(0.114)
VolOCI	-3.078***	-2.790***	-2.944***	-2.851***
	(1.051)	(1.068)	(1.049)	(1.047)
VolOCI_SSE	4.282***	4.043***	3.939***	3.908***
	(1.508)	(1.512)	(1.468)	(1.480)
FsaleRatio	-0.225*	-0.191	-0.250*	-0.255*
	(0.132)	(0.135)	(0.131)	(0.133)
Dividend	-0.163**	-0.167**	-0.151**	-0.155**
	(0.067)	(0.070)	(0.068)	(0.067)
GrowCap	0.149	0.158	0.154	0.155
	(0.099)	(0.101)	(0.102)	(0.100)
Leverage	-0.021	-0.028	-0.053	-0.006
	(0.196)	(0.198)	(0.191)	(0.190)
Liquidity	0.037	0.043	0.035	0.036
	(0.044)	(0.045)	(0.044)	(0.044)
Tassets	-0.390***	-0.409***	-0.397***	-0.395***
	(0.042)	(0.043)	(0.041)	(0.043)
ROA	8.131***	7.813***	8.121***	8.092***
	(1.186)	(1.241)	(1.190)	(1.198)
Industry/Year	Yes	Yes	Yes	Yes
Observations	1310	1253	1310	1310
R^2	0.424	0.431	0.425	0.426

***Notes*:** Table 1.3 presents the results of Equation (4) with firm value as the dependent variable. Firm value is measured by market to book value of assets *(MVBA*). All other variables are described in Appendix 1. Column (2) sample excludes observations associated with IS reporting. Standard errors (clustered at the firm level) are in parentheses.
$^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 1.4 Firm Value Supplemental: Difference-in-Difference Analyses

$$Firm\ Value_{i,t} = a + \beta_1 Changer_i + \beta_2 Pre_t + \beta_3 Changer_i * Pre_t + \beta_4 CFhedge_{i,t} + \beta_5 FirmFE_i + \varepsilon_{i,t} \quad (7)$$

	(1)	(2)	(3)	(4)
	Full Sample	High VolOCI	Low VolOCI	Full
Changer	-0.431	-0.257	-0.424	-0.392
	(0.356)	(0.392)	(0.488)	(0.356)
Pre	-0.124	-0.214**	0.036	0.042
	(0.107)	(0.107)	(0.207)	(0.130)
*Changer*Pre*	0.080	0.239***	-0.165	-0.101
	(0.080)	(0.081)	(0.164)	(0.116)
CFhedge	0.239***	-0.049	0.732***	0.246***
	(0.086)	(0.082)	(0.193)	(0.087)
HighVolOCI				0.200
				(0.138)
*Changer*HighVolOCI*				-0.189
				(0.120)
*Pre*HighVolOCI*				-0.355**
				(0.158)
*Changer*Pre*HighVolOCI*				0.376**
				(0.174)
FirmFE	Yes	Yes	Yes	Yes
Observations	1310	655	655	1310
R^2	0.845	0.912	0.840	0.846

***Notes*:** Table 1.4 presents the results of Equation (7) with firm value as the dependent variable. Firm value is measured by market to book value of assets *(MVBA*). All other variables are described in Appendix 1. Firm fixed effects are included. Standard errors are in parentheses. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 1.5 Hedging Practice Summary

Panel A: CF Hedging Participation by Year

Year	Firms with FX exposure	Firms with FXCF hedging		Firms with Other CF hedging	Firms without CF hedging
		FXCF firms	% Exposed		
Number of Firms 2010-2015	244	128	52.46%	72	92
2010	225	118	52.44%	46	72
2011	251	121	48.21%	47	74
2012	234	117	50.00%	52	65
2013	225	109	48.44%	51	58
2014	206	99	48.06%	45	54
2015	185	83	44.86%	34	49

Panel B: FXCF Hedger Subsample Summary and Differences in Means

	Firms with FXCF hedging		Firms without FXCF hedging		FXCF - without FXCF
	Firm-year observations	Subsample mean	Firm-year observations	Subsample mean	
SSE	436	0.304	701	0.272	0.033
FsaleRatio	436	0.483	701	0.358	0.125***
Dispersion	436	0.785	701	0.580	0.205***
Imbalance	436	0.376	701	0.330	0.046*
VolDollar	436	0.856	701	0.834	0.022
GrowSale	436	0.048	701	0.054	-0.006
Leverage	436	0.255	701	0.225	0.031***
Liquidity	436	0.838	701	0.941	-0.103*
TaxConv	436	0.703	701	0.599	0.103***
HHI	436	0.271	701	0.225	0.046**
Tassets	436	9.147	701	8.981	0.166***
Employees	436	3.066	701	2.529	0.537***
ROA	436	0.078	701	0.073	0.006*
HP	436	0.012	701	0.012	-0.000
HN	436	-0.014	701	-0.015	0.002
EquityInc	302	0.158	494	0.222	-0.063***
Jsecurity	304	1.354	503	1.386	-0.032
OtherHedge	436	0.673	701	0.435	0.238***

Notes: Table 1.5 summarizes the hedging practices for the firms in our final sample. Panel A presents the CF hedging participation by year. CF hedgers are split into those employing FXCF hedging and those that engage in CF hedging but not FXCF hedging specifically. Panel B compares subsample means between firms with and without FXCF hedging. The FXCF hedging subsample includes only observations that have available data for constructing *FXCFdegree* and other control variables.

Table 1.6 FXCF hedge participation decision- Probit

$$FXCFhedge_{i,t} = a + \beta_1 SSE_{i,t} + \beta_2 FsaleRatio_{i,t} + \beta_3 Dispersion_{i,t} + \beta_4 Imbalance_{i,t} + \beta_5 VolDollar_{i,t} + \beta_6 GrowSale_{i,t} + \beta_7 Leverage_{i,t} + \beta_8 Liquidity_{i,t} + \beta_9 TaxConv_{i,t} + \beta_{10} HHI_{i,t} + \beta_{11} Size_{i,t} + \beta_{12} Manage_{i,t} + \beta_{13} ROA_{i,t} + \beta_{14} OtherHedge_{i,t} + \varepsilon_{i,t} \quad (5)$$

	(1)	(2)	(3)	(4)
SSE	0.288**	0.279*	0.429**	0.411**
	(0.142)	(0.143)	(0.187)	(0.190)
FsaleRatio	1.012***	0.976***	0.862*	0.800*
	(0.325)	(0.329)	(0.465)	(0.441)
Dispersion	0.537***	0.494***	0.633***	0.735***
	(0.170)	(0.170)	(0.217)	(0.218)
Imbalance	0.247**	0.315***	0.443***	0.424***
	(0.097)	(0.100)	(0.132)	(0.129)
VolDollar	-0.093	-0.084	0.012	0.015
	(0.197)	(0.194)	(0.253)	(0.255)
GrowSale	-0.004	0.038	0.169	-0.100
	(0.278)	(0.281)	(0.352)	(0.349)
Leverage	-0.119	-0.058	0.160	0.137
	(0.311)	(0.317)	(0.459)	(0.450)
Liquidity	-0.008	0.054	0.186***	0.147**
	(0.048)	(0.053)	(0.067)	(0.067)
TaxConv	0.207**	0.267***	0.357***	0.364***
	(0.097)	(0.098)	(0.127)	(0.126)
HHI	0.071	0.041	-0.178	-0.099
	(0.105)	(0.104)	(0.145)	(0.143)
Tassets	0.251***			
	(0.050)			
Employees		0.248***	0.290***	0.266***
		(0.046)	(0.063)	(0.062)
ROA	-0.673	-1.234*	-2.308***	-2.627***
	(0.754)	(0.730)	(0.894)	(0.909)
HP	0.762	1.104		
	(1.695)	(1.691)		
HN	1.445	1.002		
	(1.895)	(1.921)		
EquityInc			-1.077***	
			(0.317)	
Jsecurity				0.127
				(0.121)
OtherHedge	0.413***	0.455***	0.484***	0.527***
	(0.103)	(0.102)	(0.131)	(0.131)
Industry/Year	Yes	Yes	Yes	Yes
Observations	1269	1267	789	800
Pseudo R^2	0.272	0.274	0.301	0.288

Notes: Table 1.6 reports the results of Equation (5), which examines the determinants of a firm's probability of engaging in FXCF hedging. Only observations with non-missing data for all control variables of each column are included. The dependent variable, *FXCFhedge*, is a dummy variable that takes the value of one if the firm engages in FXCF hedge during the period, and zero otherwise. All other variables are described in Appendix 1. Standard errors (clustered at the firm level) are in parentheses. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 1.7 FXCF hedge level decision - OLS regression

$$FXCFdegree_{i,t} = a + \beta_1 SSE_{i,t} + \beta_2 VolHedGL_{i,t} + \beta_3 VolHedGL_{i,t}*SSE_{i,t} + \beta_4 FsaleRatio_{i,t} + \beta_5 Dispersion_{i,t} + \beta_6 Imbalance_{i,t} + \beta_7 VolDollar_{i,t} + \beta_8 GrowSale_{i,t} + \beta_9 Leverage_{i,t} + \beta_{10} Liquidity_{i,t} + \beta_{11} TaxConv_{i,t} + \beta_{12} HHI_{i,t} + \beta_{13} Size_{i,t} + \beta_{14} Manage_{i,t} + \beta_{15} IMR_{i,t} + \varepsilon_{i,t} \quad (6)$$

	(1)	(2)	(3)	(4)	(5)
SSE	0.117	0.036	0.077	0.259	0.243
	(0.077)	(0.065)	(0.074)	(0.167)	(0.153)
VolHedGL	0.040				
	(0.036)				
*VolHedGL*SSE*	0.062				
	(0.072)				
HighVol		-0.007	0.017	0.177*	0.227*
		(0.058)	(0.061)	(0.103)	(0.124)
*HighVol*SSE*		0.235**	0.218**	0.286*	0.274*
		(0.110)	(0.099)	(0.159)	(0.156)
FsaleRatio	-0.048	-0.021	0.091	0.242	0.372
	(0.231)	(0.199)	(0.180)	(0.239)	(0.264)
Imbalance	0.005	0.004	0.052	0.221	0.212
	(0.049)	(0.052)	(0.069)	(0.159)	(0.154)
Dispersion	-0.041	-0.045	-0.083	0.053	-0.105
	(0.128)	(0.117)	(0.109)	(0.223)	(0.176)
VolDollar	-0.023	-0.011	-0.022	-0.028	-0.054
	(0.079)	(0.078)	(0.077)	(0.094)	(0.094)
GrowSale	-0.048	-0.013	0.019	0.235	0.185
	(0.131)	(0.134)	(0.138)	(0.246)	(0.223)
Leverage	-0.170	-0.219	-0.125	0.231	0.023
	(0.202)	(0.216)	(0.187)	(0.285)	(0.221)
Liquidity	-0.008	-0.010	0.040	0.147*	0.142*
	(0.020)	(0.021)	(0.036)	(0.081)	(0.079)
TaxConv	0.058	0.048	0.075	0.098	0.096
	(0.055)	(0.054)	(0.060)	(0.087)	(0.085)
HHI	-0.123***	-0.126***	-0.098**	-0.213**	-0.175**
	(0.043)	(0.042)	(0.044)	(0.093)	(0.079)
Tassets	0.086**	0.077*			
	(0.040)	(0.041)			
Employees			0.136**	0.238**	0.221**
			(0.063)	(0.117)	(0.107)
ROA	0.586	0.655	0.380	-0.240	-0.424
	(0.551)	(0.479)	(0.415)	(0.629)	(0.698)
HP	2.136	2.126*	2.834**		
	(1.365)	(1.232)	(1.404)		
HN	-0.142	-0.020	0.221		
	(0.765)	(0.765)	(0.746)		
EquityInc				-0.663	
				(0.587)	
Jsecurity					0.116
					(0.076)
IMR	0.530**	0.523**	0.615**	1.003*	0.826*
	(0.252)	(0.255)	(0.296)	(0.559)	(0.470)
Industry/Year	Yes	Yes	Yes	Yes	Yes
Observations	436	436	436	249	249
R^2	0.366	0.377	0.410	0.511	0.511

Notes: Table 1.7 reports the results of Equation (6), which examines the determinants of a firm's level of FXCF hedging for firms engaging in FXCF hedging in that reporting period and with available data to compute FXCF hedging level. The dependent variable, *FXCFdegree*, represents the level of FXCF hedging, computed as the total notional value divided by foreign gross profit. *IMR* is the inverse Mills ratio obtained from Equation (5) to control for the potential sample-selection bias of the FXCF hedger sample. All other variables are described in Appendix 1. Loss observations in column (4) and (5) due to missing data for *EuityInc* and *Jsecurity*. Standard errors (clustered at the firm level) are in parentheses. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Appendix 1: Variable Construction

Name	Construction and Data Source
Dependent Variables	
Spread	Daily percentage bid-ask spread, calculated as: bid-ask spread scaled by the mid-point of the two quotes that define the spread (CRSP: BID, ASK)
abVol	Abnormal trading volume, calculated as the difference between average daily trading volume for firm *i* during the information period (IP) and the normal period (NP), adjusted by the difference between average daily trading volumes for the S&P 500 during the information period and the normal period. Daily trading volume is the percentage of shares outstanding that trade on the day (CRSP: VOL; Hand-collected from 10-k: annual reporting date)
MVBA	Market to book value of assets, market value of assets is calculated as the market value of equity two months after fiscal year end (*MKV2mon*) plus the book value of debt (CRSP: SHROUT PRC) divided by book value of total assets (Compustat: TA).
FXCFhedge	Dummy variable equals 1 if the firm engages in FXCF hedge, 0 otherwise (Hand collected from 10-K footnotes)
FXCFdegree	Total notional value of FX contracts designated as FXCF hedge, in US dollar (Hand collected from footnotes) scaled by foreign gross profit. Foreign gross profit is computed as: GP ratio × foreign sales (Hand collected from 10-K footnotes, and Compustat: GP)
Reporting Transparency	
SSE	Dummy variable that takes the value of one when OCI is reported in SSE format in the period, and zero otherwise (Hand collected from 10-K footnotes)
Independent Variables	
CFhedge	Dummy variable equals 1 if the firm engages in any CF hedge, 0 otherwise (Compustat CIHEDGEGL)
AOCIhedge	The amount of unrealized cash flow hedging gains and losses recorded in AOCI at the end of year *t*, scaled by sales for year *t (*Compustat: AOCIDERGL, SALE)
VolOCI	Incremental volatility of OCI over volatility of NI, calculated as 3-year standard deviation of total comprehensive income scaled by total assets, minus 3-year standard deviation of net income scaled by total assets (Compustat CI, NI)
FsaleRatio	The ratio of foreign sales to the firm's total sales. Foreign sales include non-domestic sales and the portion of domestic sales that is identified as export (Compustat Segments: SALES)
Dispersion	Geographic dispersion calculated as ΣAiln(1/Ai), where Ai is the ratio of subsidiary i's sales to the firm's total sales (Compustat Segments: SALES)
Imbalance	Degree to which a firm is *imbalanced* in terms of foreign revenues and foreign expenses, calculated as: *FsaleRatio* – *FassetRatio.* The *FassetRatio* is foreign assets identified as non-domestic identifiable assets, or long-lived assets or PPE if identifiable assets is missing scaled by the firm's total assets. If identifiable assets are missing, then foreign long-lived assets or PPE are used in which case total long-lived assets or PPE is used for scaling (Compustat Segments)
VolDollar	Exchange rate volatility, calculated as the standard deviation of the trade-weighted U.S. Dollar index (broad, monthly) over previous 5 years (FRED)
VolHedGL	Lagged volatility of reported unrealized cash flow hedging gain or loss relative to lagged volatility of net income, calculated as 3-year standard deviation of CIDERGL over 3-year standard deviation of net income (Compustat)
HighVol	Dummy variable equals to 1 if the firm experienced high level (upper quartile) of reported unrealized cash flow hedging gain or loss (Compustat: CIDERGL) in the previous year, and 0 otherwise.

Changer	Dummy variable equals to 1if a firm switch from SSE reporting to SCI or IS reporting upon the implementation of ASU 2011-05, and 0 otherwise
Pre	Dummy variable equals to 1 for the years before Changer firms switch their reporting format and 0 for the year and the years after the switch. For firms that always report transparently, *Pre* equals to 1 for the years prior to the effective date of ASU 2011-05 and zero otherwise
HighVolOCI	Dummy variable equals to 1 for the firm-years with above median OCI volatility and 0 otherwise
Control Variables	
Lmval	The natural log of market value (PRCC_F x CSHO) (Compustat)
Big4	Equals 1 if the firm is audited by a Big 4 firm and 0 otherwise (Audit Analytic)
GrowCap	Growth rate of real capital expenditure, calculated as: CAPX in year +1 adjusted for CPI to CAPX in year 0, minus 1 (Compustat and FRED)
Loss	Equals 1 if the firm has a loss in year t and 0 otherwise
Coverage	The number of analysts used to calculate the mean consensus forecast for the year t (IBSE)
Surprise	Net income (NI) in year t minus net income in year t-1 scaled by price in year t-1 (Compustat)
VolEarn	Earnings volatility, calculated as: standard deviation of quarterly earnings over previous 3 years, scaled by total assets (Compustat)
NonSoph	Dummy variable that takes the value of 1 if the percentage of institutional ownership is below the sample median and 0 otherwise (Thomson Reuters)
Dividend	A dummy variable that takes the value of 1 if the firm paid a dividend in the current year and 0 otherwise (Compustat)
Leverage	Financial leverage, calculated as: Total debt /AT (Compustat)
Liquidity	Cash and cash equivalent divided by current liabilities (Compustat)
Tassets	Log of firm total assets (Compustat)
ROA	Firm profitability, calculated as: NI / AT (Compustat)
GrowSale	Growth rate of total sales, calculated as SALE in year+1 to SALE in year 0, minus 1 (Compustat)
TaxConv	Tax convexity, an indicator variable equal to one if a firm has positive net income and non-zero NOL tax carryforwards in a year, and zero otherwise (Compustat)
HHI	Herfindahl-Herschmann index calculated as the sum of squared market share of each firm competing in the industry, as classified by two-digit SIC codes (Compustat Global)
Employees	Log of thousands of employees (Compustat)
DA	Discretionary accruals, computed using modified Jones model (Compustat)
HP	High positive *DA*, equal to *DA* if *DA* $\geq$ 75 percentile, 0 otherwise
HN	High negative *DA*, equal to *DA* if *DA* $\leq$ 25 percentile, 0 otherwise
EquityInc	Sensitivity of CEO's stock and stock option holdings to change in stock price, calculated as the effect of a 1 percentage point increase in firm's stock price on CEO's equity holding (1pct), scaled by total annual compensation computed as the sum of 1pct, cash salary and bonus (ExecuComp)
Jsecurity	CEO job security that takes a value of 0, 1 or 2, constructed as the sum of two indicator variables: CEO-Director duality and insider-dominated board (ExecuComp and BoardEx)
OtherHedge	Dummy variable equals 1 if a firm engages in non-currency hedges, commodity hedging or interest rate hedging, and zero otherwise (Hand collected from 10-K footnotes)

Chapter 2:

TRANSPARENCY OF TRANSLATION: HAS THE SHIFT CHANGED HEDGING PRACTICE?

1. INTRODUCTION

Translation exposure results when a company has a consolidated foreign subsidiary that reports in a currency other than the parent. This type of exposure, often referred to as accounting exposure, does not result in an associated cash flow impact until the sale or liquidation of the subsidiary. In the interim, large swings in translations gains and losses can occur as the functional currency of a subsidiary fluctuates relative to the parent's reporting currency. The predominate accounting treatment for current period translation gains and losses is to include them as part of comprehensive income (CI), with the accumulation of translation gains and losses as an adjustment within shareholders' equity.

Reporting requirements for other comprehensive income (OCI) under Accounting Standard Update (ASU) 2011-05 (Financial Accounting Standard Board (FASB), June 2011) increase the financial statement prominence of these potentially transitory translation gains and losses, one of the largest items of OCI, by requiring that they appear on the face of the income statement or in a separate statement. This change shed new light on an item that had primarily been reported by most firms opaquely within the Statement of Shareholders Equity (SSE) even though as noted by Luecke and Meeting (1998), "it hides comprehensive income in the middle of the financial statements." Leslie Seidman, Chairman of the Financial Accounting Standards Board (FASB) at the time, said: "We heard from investors there was a need to present other comprehensive income more prominently in financial statements." (FASB, 2011) Although not a step back to reporting within net income as under FASB Statement No.8 (FASB, 1975), ASU 2011-05

marked a clear decision by accounting authorities that these items are relevant and should be more visible to investors.

While some firms reported OCI items on the face of the income statement or in a separate statement prior to ASU 2011-05, increased transparency of OCI was not embraced by most firms, with 74 percent of the S&P 500 reporting OCI only within the SSE. According to Du, McEnroe, and Stevens (2016) about sixty percent of the comment letters to the ASU exposure draft were negative believing it would "distract users from focusing on the relevant financial measures." If managers act in a manner consistent with the concerns expressed to the exposure draft, how might they work to mitigate the impact of prominent OCI reporting? One way of mitigating the volatility of reported translation gains and losses is to hedge this exposure. For firms that engage in net investment hedging (NI hedging), any resulting hedging gains and losses act to offset the translation adjustment in OCI. Firms may hedge their net investment in a foreign subsidiary by taking out a loan denominated in the foreign currency or by using derivatives.

The purpose of this study is to examine the impact on NI hedging of a change in the reporting location of translation gains and losses under ASU 2011-05. We make two important contributions to the literature. First, we investigate whether managers alter either their decision to hedge or their level of NI hedging when translation adjustments are reported more transparently. Second, while textbooks suggest that balance sheet hedging using debt is the most effective form of NI hedging, we are the first to explore why firms hedging this exposure appear almost equally to hedge exclusively with derivatives or hedge exclusively with debt.

The remainder of the article proceeds as follows: the next section summarizes the literature on OCI, reporting location, and hedging practice and provides background on translation accounting and reporting; the third section presents our hypotheses; the fourth section describes

the data selection, research design, and variable construction; the fifth section presents the main results along with robustness tests; and the final section provides our concluding remarks.

2. PRIOR LITERATURE ON OCI AND RELATED TOPICS

This is the first study we are aware of that specifically examines the change in the NI hedging behavior before and following the issuance of ASU-2011-05. There are studies that have looked at the reporting location impact of OCI that are directly related to this research. Further, the extant literature regarding reporting transparency and hedging practice is also relevant to our study. Finally, to understand the significance of the shift in financial reporting we provide historical background on the accounting and reporting of translation exposure.

2.1. OCI and Reporting Location

Chambers, Linsmeier, Shakespeare, and Sougiannis (2007) find that in the post-FAS 130 (FASB, 1997) period, the type of financial statement in which firms report OCI and its components affects pricing. This result is consistent with an experiment conducted by Hirst and Hopkins (1998) showing Income Statement disclosure of CI is effective in enhancing the transparency of financial reporting. They further show that half of the pool of research analysts fail to recall CI when it is reported within the SSE. Maines and McDaniel (2000) use experiments to show that the volatility of CI, when reported separately, is reflected in nonprofessional investor assessments of firm and managerial performance.

While these experiential studies suggest that more transparent reporting increases investor awareness of OCI, empirical studies have been inconclusive regarding the value relevance of this information or whether the information is being properly impounded in firm value. Kim (2017) finds that OCI is only value relevant after ASU 2011-05, regardless of the prior reporting format. This suggests that the spotlight shed on OCI items by accounting authorities resulted in increased

investor attention to an item that was previously ignored in valuation. The author also finds that negative OCI is incrementally more value relevant, consistent with Bernstein's (1993) suggestion that increasing cumulative translation losses is "usually symptomatic of a failure to manage properly the foreign exchange exposure." Koonce, Lipe, and McAnally (2005) also suggest that investors are more sensitive to negative information.

A study by Lin, Martinez, Wang, and Yang (2018) finds the exact opposite result. They find the market prices OCI only when it is reported in the SSE. This is inconsistent with the notion that investors should be more capable of incorporating information reported in a more transparent location into prices. The authors conclude that transparent reporting may adversely affect the value relevance of OCI because it "increases volatility and reduces the predictive value of accounting income." These studies together suggest that while sophisticated investors were able to properly incorporate OCI in firm value when reported less transparently, the increased prominence particularly in settings of high volatility of OCI items or negative OCI items, may confuse more naïve investors leading to incorrect incorporation of this information in firm value.

One reason for the conflicting results may be differences in the level of voluntary disclosure across firms. Pinto (2005) found that OCI, of which translation adjustments are the largest, are a significant source of value relevant information for investors. However, she cautions that investors need supplemental disclosures regarding foreign operations to form accurate perceptions about a firm's exchange rate exposure.

2.2. OCI Reporting and Managerial Behavior

Previous research suggests that managers are concerned about OCI items and that these items impact future behavior. Biddle and Choi (2006) allude to the fact that managers have lobbied to exclude items, like translation gains and losses, over which they have no control. Graham and

Lin (2018) find a direct link between current year OCI and future discretionary financing, investing, and operating expenditures. Bamber, Jiang, Petroni, and Wang (2010) show that managers with greater equity incentives and less job security are more likely to report only in the SSE when allowed. They also find evidence suggesting firms with greater institutional ownership and analysts following are more likely to report transparently when not mandated.

While managers cannot control the impact of exchange rates on their consolidated balance sheet, NI hedging can minimize the volatility of this OCI item. It stands to reason that if increased transparency led to increased value relevance of OCI (Kim, 2017), particularly in the case of OCI losses, managers would be motivated to minimize volatility relating to those items outside of their control. Bonini, Dallocchio, Raimbourg, and Salvi (2016) show that firms exposed to translation risk hedge this risk, and the hedging decision is long-term and persistent.

The literature suggests that debt and debt-like instruments (swaps) are the most likely vehicles to engage in NI hedging. According to Moffett, Stonehill, and Eiteman (2015), "the main technique to minimize translation exposure is called a balance sheet hedge." A balance sheet hedge is accomplished by using foreign liabilities to finance exposed foreign assets. This is consistent with Clark and Judge (2009), who find that firms use derivatives to hedge short-term exposure related to trading activities, while foreign-denominated debt and cross-currency swaps are utilized for hedging long-term exposure related to net foreign investment.

2.3. OCI and Translation Accounting and Reporting Regulations

Most major currencies began to float freely following the collapse of the Bretton Woods system between 1968 and 1973. The initial response by accounting authorities to the resulting gains and losses from exchange rate changes in the U.S. was to issue FASB Statement No. 8 in 1975. This Statement required all amounts measured in a foreign currency be translated at the exchange rate

in effect at the date at which the foreign currency transaction was measured. All exchange gains and losses were required to be included in income in the period in which they arose.

In 1981, Financial Accounting Standard (FAS) 52 (FASB, 1981) was issued in response to concerns by public companies regarding the volatility introduced to corporate earnings arising from currency translation. Specifically, FAS 52 eliminated the inclusion in income of translation adjustments arising from consolidating a self-contained foreign subsidiary. Under FAS 52, "adjustments for currency exchange rate changes are excluded from net income for those fluctuations that do not impact cash flows and are included for those that do." These translation adjustments were disclosed in the footnotes and the resulting gains and losses were accumulated as a separate component of shareholders' equity until the foreign entity's sale or liquidation. The result was that FAS 52 significantly reduced the prominence of translation adjustments.

FAS 130, released in 1997, established standards for the reporting and display of CI and its components. CI is the combination of net income or net loss plus OCI items. Examples of OCI include foreign currency translation gains and losses, unrealized gains or losses on hedging instruments, and unrealized gains or losses on postretirement benefits. In the presence of lower earnings and increased currency volatility, currency translation gains and losses can be a far greater portion of CI (Sorensen and Kyle, 2008). Firms had three location choices for reporting CI when it was first required in 1997, although most displayed CI only as part of the SSE.

In June 2011, the FASB issued Accounting Standards Update (ASU) No. 2011-05 Comprehensive Income (Topic 220): Presentation of Comprehensive Income (FASB, June 2011). The intention of the update was to increase the consistency and prominence in the financial statements of CI. The amendment did not change the nature of the items recognized as OCI but simply resulted in a change in reporting location to increase transparency.

Fundamentally, ASU 2011-05 eliminated the option of displaying CI only within the SSE. For public and nonpublic entities, the amendment requires presentation of OCI in either the Income Statement (IS) or a separate Statement of Comprehensive Income (SCI) for fiscal years beginning after December 15, 2011 and 2012, respectively, with early adoption permitted.

In summary, translation gains and losses went from initially being included in net income to being reported only as an item of OCI generally buried in the SSE. The original shift in reporting location was in response to concerns by public companies regarding the volatility introduced to corporate earnings arising from currency translation. Ultimately with ASU 2011-05 accounting authorities have reversed course. By requiring greater visibility of translation gains and losses they chose to override concerns by managers of public companies in favor of making this information more accessible to investors.

Since 1981, managers have expressed concern over the volatile reporting of translation gains and losses. OCI influences investors and hence managers believe it has consequence and could act to reduce its impact through hedging. Following Hirst and Hopkins (1998), we expect greater transparency of OCI items to increase not only investor but also manager focus on these items leading to an increase in the degree of NI hedging. On the other hand, based on the findings of Bonini et al. (2016) we also expect to find persistent long-term hedging decisions. If a firm's hedging participation decision is persistent, firms that do not hedge will be unlikely to switch in response to the statement change alone.

3. HYPOTHESES DEVELOPMENT

3.1. NI hedging participation and level

Our purpose is to examine how reporting transparency of translation gains and losses impacts managerial behavior regarding NI hedging. We expect managers of firms reporting OCI items

only within the SSE prior to ASU 2011-05, to be those most concerned that investors will be confused by volatile translation gains and losses. Post ASU 2011-05, we expect firms that previously reported more opaquely to be more likely to engage in NI hedging and/or engage in a higher level of hedging to reduce the volatility of reported translation gains and losses. Since transparent formats were adopted by some firms prior to the mandated implementation of ASU 2011-05, the effective date is not an ideal cutoff point for our comparison. Hence, we use the different reporting formats to capture the degree of reporting transparency and compare the hedging practice between opaque and transparent reporting. This leads to H1a:

H1a*: NI hedging and its level are increased with reporting transparency.*

Further, if managers are concerned that investors may be distracted by swings in translation gains and losses over which they have no control, a measure of volatility in reported translation gains and losses could be associated with the hedging decision. This leads to H1b:

H1b*: NI hedging and its level increase with the volatility of translation gains and losses.*

Kim's (2017) finding that translation losses are incrementally more value relevant following increased transparency leads us to hypothesize that cumulative losses may be more likely to drive hedging changes following ASU 2011-05 than cumulative gains. This leads to H1c:

H1c*: NI hedging and its level increase with cumulative translation losses more than cumulative translation gains.*

3.2. Instruments used for NI hedging

In addition to the participation and level decisions, managers that choose to reduce translation exposure by hedging must also decide between two alternative instruments – foreign-denominated debt or foreign currency derivatives. Elliott, Huffman, and Makar (2003) find that the use of foreign debt is positively related to foreign currency risk exposure and negatively

related to the use of foreign currency derivatives. Whenever possible, firms would prefer a hedging vehicle that is more related to the exposure they intend to hedge against, that is, firms are more likely to use foreign debt or debt-like instruments for hedging long-term exposure to equity in a foreign subsidiary. Therefore, we expect greater use of debt instruments among firms that hedge more. This leads to H2a:

***H2a**: Higher levels of NI hedging are associated with the use of debt instruments.*

Furthermore, if firms are more likely to hedge their translation exposure or hedge more after the increase in reporting transparency (H1a), we expect these firms will also increase the use of foreign-denominated debt after ASU 2011-05 as this is a more suitable vehicle for hedging long-term exposure. This leads to H2b:

***H2b**: Firms increase in the use of debt for NI hedging following increased transparency.*

Since debt instruments are long-term in nature compared to derivative contracts, the use of debt is less subject to adjustment, while derivatives are more flexible and could be subject to speculative use. Moffett et al. (2015) suggests that hedging translation exposure in the forward market "amounts to speculating in the forward market in the hope that a cash profit will be realized to offset the noncash loss from translation." Since hedging with debt is more long-term in nature and less subject to adjustment, we expect that over time this hedging will offset both translation gains and losses. On the other hand, if some firms employ derivatives to selectively hedge translation losses only, we should see a decrease in the likelihood of derivative use (equivalent to an increase in the likelihood of debt use) in the presence of cumulative translation gains. Thus, a higher proportion of debt in the presence of cumulative gains would provide evidence of selective hedging with derivatives. This leads to H2c:

***H2c**: Firms exhibiting a preference for debt (derivatives) are more (less) likely to hedge cumulative translation gains.*

4. DATA AND RESEARCH DESIGN

4.1. Sample Selection

We start with S&P 500 firms because most have both translation exposure and the necessary personnel to manage currency risk. Further, this is the same set of firms examined in Kim (2017) and Lin, et al. (2018) that yielded different conclusions regarding the value relevance of OCI when reported more transparently. Our sample period runs from 2010 to 2015, including the year that the provisions of ASU 2011-05 became mandatory. All firms included in the S&P 500 at any time during our sample period are included to avoid survivorship bias, resulting in 638 index constituents. We drop 57 firms with significant changes in ownership for any reason (IPO, spinoffs, significant mergers and/or acquisitions, etc.), leaving 581 firms in our available sample.

We hand collect data on each sample firm's hedging policy and notional value of NI hedging using the footnotes to the financial statements, either narrative or tabular. We use Compustat Historical Segment data, which provides some accounting data by geographic segments, to identify the level of translation exposure in terms of foreign assets. After excluding 128 firms with no evidence of translation exposure and deleting firm-years with missing Compustat Segment and other data in constructing variables, 307 firms and 1,691 firm-year observations remain to constitute our preliminary Exposer sample. Since only firms that cross the effective date of ASU 2011-05 are relevant to the hypotheses being tested, we exclude 45 firm-year observations belonging to 22 firms that either drop out from our sample before ASU 2011-05 or come into our sample after ASU 2011-05. This leaves a final Exposer sample of 1646 firm-year observation representing 285 firms across the effective date of ASU 2011-05.

We provide a breakdown reconciling to our final Exposer sample of 285 firms below:

S&P 500 firms	**638**
Less firms with significant ownership changes	-57
Available sample	**581**
Less firms with no translation exposure	-128
Less firms with missing foreign assets data	-129
Less firms with missing data for other variables	-17
Less firms only pre or post ASU 2011-05	-22
Exposer sample	**285**

Of the 285 Exposer firms, only 73 firms engage in NI hedging and have sufficient detail regarding notional amounts for each year they hedge, resulting in 296 firm-year observations as Hedger subsample. One firm with 6 firm-year observations constitutes an outlier and is eliminated. The Hedger subsample for examination of hedging level and mix is represented by 72 firms and 290 firm-year observations. This subsample represents the 25 percent of our Exposer sample that hedged translation exposure at some point during the sample period.

We manually check the location for reporting CI used by our sample firms each year. Before ASU 2011-05, most firms tended to display CI in SSE. ASU 2011-05 eliminated the option of displaying CI only within the SSE. There were 228 firms that changed reporting location from SSE during the sample window, representing 80 percent of our Exposer sample. For most firms in our Exposer sample, they had two years to report in a less transparent manner and then four reporting years where CI had greater financial statement visibility.

4.2 NI Hedging Participation

We are interested in whether firms change their NI hedging practice when reporting OCI in a more transparent format following ASU 2011-05. We examine both the decision to engage in NI hedging (participation) and the degree of NI hedging (level). Results from ordinary least squares (OLS) regressions may be subject to potential sample selection bias because firms have a choice of whether to hedge translation exposure. To address this concern, we perform the Heckman

(1979) two-stage procedure. In the first stage, we model the determinants of the hedging choice, *NIHedge*, as a function of the change in reporting transparency (*se*), volatility of reported translation gains and losses *(VolTran)*, cumulative translation results, and other control variables with the following panel Probit model:

$$NIHedge_{i,t} = a + \beta_1 se_{i,t} + \beta_2 VolTran_{i,t} + \beta_3 CumGain_{i,t} + \beta_4 CumGain_{i,t}*se_{i,t} + \beta_5 CumLoss_{i,t} + \beta_6 CumLoss_{i,t}*se_{i,t} + \beta_7 Dispersion_{i,t} + \beta_8 Incentive_{i,t} + \beta_9 Size_{i,t} + \beta_{10} Leverage_{i,t} + \beta_{11} Liquidity_{i,t} + \beta_{12} ROA_{i,t} + \beta_{13} OtherHedge_{i,t} + \varepsilon_{i,t} \quad (1)$$

Where *NIHedge* takes the value of one if the firm engages in NI hedging during the period, and zero otherwise. The dummy variable *se* takes the value of one when OCI is reported only in the SSE and zero otherwise. As we mentioned before, we use the different reporting formats to capture the degree of reporting transparency and examine the incremental impacts between opaque and transparent reporting on hedging practice. Only firms that were forced to switch from more opaque reporting have a non-zero value for *se*. Based on our hypothesis **H1a**, we expect a negative relation between *NIHedge* and *se*, suggesting a higher likelihood of NI hedging for firms reporting transparently. Under hypothesis **H1b**, we expect a positive relation between *NIHedge* and *VolTran*, the volatility of reported translation gains and losses. *VolTran* is computed as the five-year standard deviation of the net translation adjustment divided by the five-year standard deviation of total assets following Lin et al. (2018).

We use the cumulative translation gain or loss to capture the impact of the actual currency changes experienced on foreign net assets historically. *CumRatio*, which scales the cumulative translation gain or loss by total assets, reflects the relative size of the cumulative translation gain or loss. We expect managers to be more likely to engage in NI hedging and to increase the hedging level when they must report ongoing translation losses rather than cumulative translation

gains (**H1c**). We separate *CumRatio* into *CumGain* and *CumLoss* under the expectation that losses are more likely to result in hedging. Hypothesis **1c** would be supported by a non-significant coefficient on β_3 and a significant coefficient on β_5. In an alternative specification, we isolate the gain or loss reported for the current period in OCI, *TranGain* or *TranLoss*, respectively, from the prior year's cumulative component, *lagCumGain* or *lagCumLoss*.

We measure the level of translation exposure using geographic dispersion. *Dispersion* is included to capture how the firm's foreign assets are spread across countries with potentially different currencies. The geographic dispersion measure (*Dispersion*) we use in this study is an entropy measure similar to that employed by Guay and Kothari (2003). It is calculated as $\Sigma A_i \ln(1/A_i)$, where A_i is the ratio of subsidiary *i*'s assets to the firm's total assets, suggesting the importance of each subsidiary. In our context, the entropy measure considers both the number of foreign subsidiaries and the asset weight of each subsidiary relative to the firm's total assets. The entropy measure should capture the multidimensional nature of geographic dispersion. Guay and Kothari (2003) show a positive relation between geographic dispersion and the use of derivatives. When we focus on translation exposure and related NI hedging, the relation can be complicated. The more dispersed a firm's subsidiaries, the more significant the firm's level of translation risk, and the more likely it would engage in NI hedging. On the other hand, if a firm spreads its subsidiaries in different currency regimes, it is possible to diversify the firm's currency risk to some degree. Thus, higher dispersion could lead to a lower level of NI hedging.

In calculating *Dispersion,* we first determine identifiable non-domestic assets, *FXAsset*, from Compustat Segment Data for each firm. For firms missing this item, we use non-domestic long-lived assets or non-domestic property, plant, and equipment (PPE), and the ratios of long-lived assets/PPE over total assets computed from the balance sheets to estimate non-domestic total

assets. For example, if a firm's PPE ratio (PPE over total assets) is 50 percent, and its non-domestic PPE is $10 million, we will estimate its *FXAsset* as $20 million. *FXRatio* is *FXAsset* scaled by the firm's total assets. In alternative specifications of Equation (1), we replace *Dispersion* with *FXRatio* as a simpler measure of translation exposure.

Managerial concerns over how investors evaluate their performance may lead to greater risk aversion, and therefore a higher probability of hedging and level of hedging. Evidence of managerial concern regarding investor evaluation of their performance may be evidenced by the presence of significant equity incentives in their compensation, or issues with job security. Following Bamber et al. (2010), we measure CEO equity-based incentives (*EquityInc*) as the sensitivity of the CEO's stock and stock option holdings to a change in stock price, calculated as the effect of a one percentage point increase in the firm's stock price on CEO's equity holding, scaled by total annual compensation (including equity compensation, cash salary, and any bonus). Job security, *Jsecurity*, is proxied by the sum of two indicator variables: CEO-Director duality and insider-dominated board. We expect mangers of firms with greater performance concerns, triggered by these incentives, to be associated with greater motivation to engage in risk management, which would lead to a positive relation with hedging.

Factors related to overall hedging practice should also be relevant to the NI hedging decision. We expect both the decision to hedge translation exposure and the level of hedging to be a function of financial leverage (*Leverage*), firm size (*Size)*, liquidity (*Liquidity*) and profitability (*ROA*). A levered firm could face covenant restrictions that would force them to manage the reported value of foreign currency denominated assets on the balance sheet to avoid triggering a violation of key ratios. Therefore, we expect a positive relation between *Leverage* and NI hedging. Since hedging has costs in terms of needed staffing for implementation and monitoring

(Brown, 2001), we expect larger and more profitable firms to be more likely to hedge translation exposure and to have higher levels of hedging relative to these exposures. Froot, Scharfstein, and Stein (1993) find a negative association between firm liquidity and hedging activities. Since they discuss overall hedging strategy that includes all types of hedging, we are unsure of the relation between liquidity and hedging level when limited to NI hedging. Our proxies for *Size* include either total assets or the total number of employees. *Leverage* and *ROA* are calculated as the long-term debt (including the current portion) and net income, respectively, divided by total assets. *Liquidity* is calculated as cash and cash equivalents divided by current liabilities.

Firms that have greater experience with other types of hedges may be less likely to have policy restrictions on hedging activities and more likely to engage in NI hedging. *OtherHedge*, which equals one if a firm engages in any other type(s) of hedging, including commodity hedging, interest rate hedging, or other currency hedging not against net foreign assets, and zero otherwise. A complete list and description of variables is provided in the Appendix 2.

4.3. NI Hedging Level

We next examine whether the prominence of OCI reporting affects the level decision of NI hedging. Only firms that engage in NI hedging are eligible for inclusion in the second stage, however, not all firms that hedge translation exposure have sufficient detail for determination of hedging level. *NIDegree* captures the level of NI hedging computed as the total notional amount of NI hedges outstanding at the fiscal year-end scaled by the firm's total foreign assets. The notional value includes contractual foreign currency derivatives, currency swaps, and foreign currency-denominated loans used to hedge translation exposure. For firms that report notional values only in foreign currency, we convert the amounts into US dollars based on the exchange rate in effect at the fiscal year-end. For firms reporting notional value aggregately, that is, total

notional value for different types of currency hedges, we cannot determine the actual value for constructing *NIDegree.* We treat these observations as missing for *NIDegree,* but they are assigned a value of one for *NIHedge* if the firm clearly states that they engaged in NI hedging activities in that period. We also exclude one firm outlier, resulting in 290 observations representing 72 firms in the Hedger subsample for the examination of level decision.

We use Heckman correction, that is, including the Inverse Mills ratio (*Invmills*), calculated from the first stage Probit Equation (1), with *Other Hedge* serving as the exclusion variable, since it is related to the decision to hedge but not the level. Further, *Dispersion* is used as the measure of translation exposure, while *FXRatio* is no longer used as the alternative in the second stage due to its construction from components of the dependent variable. Our second stage OLS regression with *NIDegree* as previously described is:

$$NIDegree_{i,t} = a + \beta_1 se_{i,t} + \beta_2 VolTran_{i,t} + \beta_3 CumGain_{i,t} + \beta_4 CumGain_{i,t}*se_{i,t} + \beta_5 CumLoss_{i,t} + \beta_6 CumLoss_{i,t}*se_{i,t} + \beta_7 Dispersion_{i,t} + \beta_8 Incentive_{i,t} + \beta_9 Size_{i,t} + \beta_{10} Leverage_{i,t} + \beta_{11} Liquidity_{i,t} + \beta_{12} ROA_{i,t} + \beta_{13} Invmills_{i,t} + \varepsilon_{i,t} \quad (2)$$

We include *Invmills,* the Inverse Mills ratio from the first stage to account for any sample selection bias. Otherwise, the control variables are the same as those used in the first stage regression. We control for year fixed effects and cluster standard errors at the firm level.

We expect a negative relation between *se* and *NIDegree* if after the change in reporting transparency, they increase the level of NI hedging (**H1a**). As outlined in **H1b**, we expect managers of firms with high translation volatility to be those incentivized to increase NI hedging to minimize future volatility of translation gains and losses. Thus, a positive β_2 is expected. In addition, under **H1c**, we expect higher levels of NI hedging in the presence of cumulative losses,

consistent with a negative and significant coefficient on *CumLoss*. On the other hand, we expect no significant relation between *CumGain* and *NIDegree*.

4.4 Mix of debt and derivative

For those firms that employ NI hedges, we examine the means used for hedging this exposure. NI hedging instruments fall into two major categories, foreign currency derivatives contracts and foreign currency debt (including currency swaps). While currency swaps are a derivative contract, we categorize them as debt because as a NI hedge they mimic foreign debt. We create a variable *DebtPortion*, calculated as the ratio of the notional value of foreign debt (including currency swaps) to the total notional amount of NI hedges on a firm-year basis. *DebtPortion* equals zero if the firm uses only derivatives to hedge its net investment exposure. *DebtPortion* equals one if the firm exclusively uses foreign debt, including currency swaps. Firms using a mixture of derivatives and debt to hedge translation exposure will fall between zero and one. *DebtPortion*, is a proportion variable bounded at zero and one, with most observations at the boundary values of zero and one. The prevalence of pure derivative and pure debt use for NI hedging are almost equally split at 39% and 44%, respectively, with a mixture of debt and derivatives constituting the other 17% of observations.

We estimate the probability of hedging primarily with debt as a function of the change in reporting transparency (*se*), hedging level (*NIDegree*), cumulative translation results (*CumGain* and *CumLoss*), and other control variables with the following Probit model:

$$DebtUser_{i,t} = a + \beta_1 se_{i,t} + \beta_2 NIDegree_{i,t} + \beta_3 CumGain_{i,t} + \beta_4 CumGain_{i,t}*se_{i,t} + \beta_5 CumLoss_{i,t} + \beta_6 CumLoss_{i,t}*se_{i,t} + \beta_7 Dispersion_{i,t} + \beta_8 Incentive_{i,t} + \beta_9 Size_{i,t} + \beta_{10} Leverage_{i,t} + \beta_{11} Liquidity_{i,t} + \beta_{12} ROA_{i,t} + \beta_{13} Invmills_{i,t} + \varepsilon_{i,t} \quad (3)$$

DebtUser is an indicator variable taking the value of one if the firm is a primary debt user (debt use is more than 50 percent of NI hedges, that is, *DebtPortion* > 0.5) and zero if derivative contracts are used primarily (*DebtPortion* ≤ 0.5). While we do not believe the choice of hedging vehicle determines the level of hedging, managers may shift their method of hedging in response to hedging level changes. Since most factors related to the selection of hedging instruments also influence the selection of the hedging level, *NIDegree* is endogenously determined in Equation (3). To address this endogeneity, we employ an instrumental variable Probit (IV Probit) estimate procedure, following Adkins, Carter, & Simpson (2007).

Newey's (1987) two-step estimator of the Probit model with an endogenous regressor is used to obtain valid standard errors. In the first step, we estimate a reduced-form equation for the endogenous variable, *NIDegree*, using all other independent variables and an instrument. Second, we estimate the Probit equation (3), replacing the endogenous *NIDegree* with its predicted value. A valid instrument must be relevant to the endogenous variable but does not impact the decision except for the influence through its correlation with the endogenous variable. The volatility of translation gains and losses *(VolTran)* influences the hedging level decision because one of the purposes of NI hedging is to smooth the reported translation adjustments, as we discussed in Section 4.3. However, we do not believe *VolTran* has a direct impact on the choice of hedging instruments since either instrument will reduce translation volatility. In other words, volatility of translation adjustments is exogenous to the choice of hedging instruments and only relevant through its impact on the hedging level. Therefore, *VolTran* serves as an appropriate instrument for *NIDegree* in our IV Probit model. Thus, the first step reduced form equation is the same as Equation (2). Since only the firms that engage in NI hedging are included

in this model, the same *Invmills* obtained from the Equation (1) is included here to correct for the potential self-selection bias of being a NI hedger. We cluster standard errors at the firm level.

Under **H2a,** we would expect *DebtUser* to be positively related to *NIDegree* that is, firms with higher levels of NI hedging are more likely to employ debt or debt-like instruments for NI hedging purpose. A negative and significant coefficient on *se* would be consistent with **H2b**, suggesting that increased transparency resulted in an increase in the use of debt to reduce future volatility. We expect a positive relation between *DebtUser* and *CumGain* if **H2c** is supported. The ability to issue debt in a foreign currency (or engage in currency swaps) may be limited to larger, more liquid, and more profitable firms. On the other hand, these firms may also have the personnel to manage derivates and can afford the cost of using these instruments. While firms that are highly leveraged may tend to exhibit a preference for debt, one could argue that highly leveraged firms may face limits on the use of additional debt. As a result, derivatives may be used or added to foreign currency debt instruments to maintain an optimal capital structure thus lower the *DebtPortion*. Therefore, we are unsure about the expected relation between *Size, Leverage, Liquidity, ROA,* and *DebtUser*.

5. RESULTS

5.1. Descriptive Statistics

A full set of descriptive statistics is provided in Table 2.1. Panel A provides a summary of the 285 firms or 1,646 firm-year observations that identify translation, Exposer sample, used for examining the hedging participation decision. Firms forced into more transparent reporting of CI, comprise 80% of our Exposer sample. However, NI hedging is only observed in 18 percent of firm-year observations, which constitutes our Hedger sample.

[Insert Table 2.1 here]

Panel B summarizes the Hedger subsample, consisting of 290 firm-year observations representing 72 firms with available data for computing the hedging level. The mean level of NI hedging is 16.4 percent of total foreign assets. While this percentage is based on foreign total assets, we realize that firms tend to hedge the net assets or equity in foreign subsidiaries rather than total assets. While we do not have foreign equity values, if we assume foreign assets are financed similarly to the parent firm then the firm's equity ratio can be used to derive an estimated foreign equity. Using estimated foreign equity values as the denominator for *NIDegree* among firms that engage in NI hedging, the average *NIDegree* is 37 percent. Debt represents 50.7 percent of all NI hedging. A correlation table of our main variables is presented in Table 2.2.

[Insert Table 2.2 about here]

5.2. Hedging Practice and Univariate Results

Table 2.3 provides a summary of hedging practice. In Panel A, we examine the portion of Exposer firms that hedge and find some evidence suggesting an increase in the use of NI hedging in years after ASU 2011-05. During the period of our sample, roughly 25 percent of our Exposer firms hedged at some time with the highest prevalence being in the later years. Except for 2014, the average hedging level gradually increased year by year. This is limited evidence consistent with **H1a**, that firms increase NI hedging with greater transparency in OCI reporting. We also observe an increase in the use of debt or debt-like instruments for NI hedging in the post-ASU period. In the last two years of our sample period, more than 50% of NI hedging is conducted with debt, consistent with prior research and **H2a**.

[Insert Table 2.3 about here]

Panel B compares the hedging practices by splitting on the pre- and post-effective dates of ASU 2011-05. Although the percentage of firms engaging in NI hedging increase from 17.89 percent to 22.81 percent, the difference is not statistically significant. The average hedging level in the post-ASU period is 17.92 percent, which is significantly higher than 13.75 percent in the pre-ASU period ($p<0.05$). Finally, the portion of hedging using debt also suggests a preference for debt versus derivatives in the post-ASU 2011-05 period although it is not statistically significant. These preliminary results suggest an increase in the NI hedging level following ASU 2011-05 while the hedging participation decision and the choice of vehicle may be persistent.

In Table 2.4, we segregate our Exposer sample into two subsamples, Hedgers and Non-Hedgers, based on participation in NI hedging. Relative to Non-hedgers, Hedgers have a significantly higher translation exposure as indicated by a greater volatility in reported translation gains and losses (*VolTran*), larger cumulative and current period translation losses (*CumLoss* and *TranLoss*, respectively), higher proportion of foreign assets to total assets (*FXRatio*), and greater geographic dispersion (*Dispersion*). CEOs of NI hedgers are not significantly different in terms of job security or level of incentive compensation, suggesting there is little evidence they should be more concerned than Non-Hedgers about the evaluation of their performance by investors. The presence of greater translation volatility and larger translation losses among NI Hedgers suggests an incentive for managers to use NI hedges to mitigate the impact of translation results.

[Insert Table 2.4 about here]

NI Hedgers are significantly larger, as measured by both total assets and employees, and more profitable. Relative to their Non-Hedger counterparts, this could suggest they are better able to issue foreign-currency denominated debt and/or have the personnel available to manage

derivatives hedging. On the other hand, Hedgers exhibit lower levels of liquidity suggestive of another motivation to protect their investment in a foreign subsidiary. In summary, managers of our subsample of NI Hedgers have both the incentive and the means to engage in NI hedging.

5.3. Determinants of NI hedging participation choice – Probit results

In Equation (1), we examine the likelihood of engaging in NI hedging as the first stage of our Heckman model. As shown in Table 2.5 Column (1), we do not find that an increase in transparency unilaterally alters the likelihood of NI hedging. Our results show that firms experiencing high volatility in net translation adjustments (*VolTran*) are more likely to engage in NI hedging, consistent with incentives to mitigate the impact of swings in this OCI item on investors' valuation or managerial performance (**H1b**). There is clear evidence that firms with larger cumulative losses are more likely to engage in NI hedging (negative coefficient on negative *CumLoss* values). This corroborates the selective hedging hypothesis **(H1c)**, that managers are more likely to hedge to protect from further translation losses. We find no evidence that managers' incentives contribute to the participation decision. Due to this insignificance coupled with a significant sample size reduction, managerial equity incentives and job security are excluded from alternative specifications of Equation (1). While our Table 2.4 results with respect to liquidity and the hedging decision are consistent with Froot et al. (1993), we find a positive relation between the engaging in NI hedging and firm liquidity in our multivariate model. As expected, larger firms engaging in other hedging activities are more likely to hedge translation exposure, although leverage appears not to have impact the hedging decision.

[Insert Table 2.5 about here]

In Columns (1) and (2), we do not find evidence that greater geographic dispersion *(Dispersion*) leads to an increased likelihood of NI hedging. As we discussed before, while greater dispersion suggests higher potential for translation exposure, it also reflects a firm that

could be diversified across currency regimes thus less likely to need NI hedging. Since the variable captures both the level of exposure and potential diversification, these competing factors may drive the insignificant coefficient of *Dispersion*. In Column (3), we replace *Dispersion* with *FXRatio* as an alternative measure of translation exposure. The likelihood of NI hedging increases with greater FX assets relative to total assets. The significantly positive coefficient on *FXRatio* suggests firms with greater translation exposure are more likely to engage in hedging.

The current level of cumulative translation is separated into two components - prior or lagged cumulative translation (*lagCumGain* and *lagCumLoss*) and current period translation *(TranGain* and *TranLoss*) in Table 2.5 Column (4). Suggestive of selective hedging (**H2c**) in the face of cumulative losses, the probability of engaging in NI hedging increases with both large prior cumulative losses (reflected by a negative coefficient on the negative values of *lagCumLoss*) and current period translation losses (reflected by a negative coefficient on the negative values of *TranLoss*).

Overall, our results in Table 2.5 show that firms are more likely to hedge when they have ongoing translation losses. We find no evidence that reporting location is a factor in the decision to hedge. Motivations for employing NI hedges are volatility in translation adjustments, cumulative losses that are suggestive of chronically weak currencies, and greater translation exposure as measured by the ratio of foreign to total assets. While being more likely to hedge losses is suggestive of selective hedging, we find no evidence that managers employ NI hedging to reduce concerns over equity-based compensation or job security. Finally, firms that select hedging have the resources and structure to support hedging activities. They tend to be larger and have other hedging experience.

5.4. Determinants of NI hedging level

While the decision to hedge may be unaffected by the reporting change, the proportion of exposure hedged could be influenced by reporting transparency. In the second stage of the Heckman model, Equation (2), we examine factors that contribute to changes in the hedging level, *NIDegree,* for our firms that engage in NI hedging. Since only NI Hedgers are examined in this stage, the Inverse Mills ratio (*Invmills*) obtained from the first stage participation decision (Equation (1)) is included to correct the potential self-selection bias related to being a NI hedger.

[Insert Table 2.6 about here]

Our findings in Column (1) of Table 2.6 show that there is no universal change in level of NI hedging in response to increased transparency (insignificant coefficient on *se*). The negative and positive coefficients on the interactions of *CumGain* and *CumLoss* with *se*, respectively, demonstrate that the hedging level associated with both accumulated gains and losses was lower when firms reported opaquely. This suggests that increases brought about by the shift to transparent reporting are primarily related to firms concerned about mitigating losses and to a lesser degree preserving gains. This evidence provides support for our hypothesis **H1a**. However, when reporting more transparently, the hedging level increases with both cumulative translation gains and losses, providing no evidence of selective hedging (**H1c**) in the level decision. While the volatility of reported translation results is a significant factor in the level determination, consistent with **H1b**, we find no evidence that managerial incentives play a role.

In Column (2) we split *CumGain* and *CumLoss* into their current period translation results (*TranGain* and *TranLos*s) and prior balances (*lagCumGain* and *lagCumLoss*). It is more evident that following a shift to increased transparency, firms responded by significantly increasing NI hedging, as the positive (negative) coefficient on *lagCumLoss*se* (*lagCumGain*se*) indicates

less hedging in opaque reporting. In contrast to the participation decision, the impact on the level decision is concentrated in prior losses. Current period translation losses do not appear to influence the level decision (*TranLoss*), while both current and prior period gains have a positive and significant impact on a firm's hedging level.

In summary, firms that hedge translation exposure appear to change their hedging level in response to a reporting change, conditional on facing greater cumulative translation adjustments. Firms modify their hedging level in response to both gains and losses when reporting transparently. The hedging level is also tied to the firm size, leverage, and liquidity. We find only weak evidence that profitability (ROA) is a factor in the level decision and no evidence managers use NI hedging to reduce concerns over job security or equity-based compensation.

5.5. Determinants of Composition of Tools Used for NI hedging

As discussed previously, there are 72 firms (290 firm-year observations) with non-zero notional amounts needed for the calculation of *DebtPortion.* In hedging translation exposure, most firms in our sample are equally split between debt or derivatives exclusively.

5.5.1 Univariate results

In Table 2.7, we provide summary characteristics and differences in means for the Hedger sample segregated by the instrument composition of NI hedges. We divide the sample into two groups based on *DebtPortion*. Firms in the Debt group (*DebtPortion* > 0.5) use foreign currency denominated debt (including cross-currency swaps) for more than 50% of NI hedging; firms in the Derivative group (*DebtPortion* ≤ 0.5) use derivative contracts for at least 50% of NI hedging.

[Insert Table 2.7 about here]

Firms in the Debt group have significantly higher levels of NI hedging (in both total notional value and relative to foreign assets) than the Derivative group, consistent with **H2a**. We observe

that firms experience higher volatility in reported translation results tend to choose debt for NI hedging, but we argue that this association is only tenable through its positive relation to hedging level. The Debt group has a significantly higher levels of both cumulative and current period translation losses, suggesting debt as a primary choice for hedging larger losses. Also, debt users are more dispersed geographically, consistent with firms that have better access to foreign debt. The use of derivatives is associated with lower leverage, greater short-term liquidity, and profitability. These findings provide preliminary evidence that the decision to use derivatives was a choice rather than due to some constraint.

5.5.2 Multivariate results

We next examine the choice of hedging instruments among hedgers with an IV Probit regression. Because *NIDegree* is endogenous, an instrumental variable estimate is used in this subsequent Probit regression of Equation (3) to ensure consistent parameter estimates. Table 2.6 columns (1) and (2) provides the results of the reduced-form estimates showing a highly significant relation between *NIDegree* and its instrument, *VolTran* (p-value=0.000). The R-squared from each regression specification are around 20%, and the F-statistics of the joint tests of instrument significance are 21 and 14, respectively, with p-value on each being zero, providing further evidence that *VolTran* is a strong instrument for *NIDegree*. Moreover, the results of Wald test of exogeneity (p-value=0.026 and 0.016) reject the null hypothesis of no endogeneity, supporting the validity of using an instrumental variable approach.

We report the coefficient estimates for the IV Probit Equation (3) in Table 2.8. Evidence that firms with higher levels of NI hedging are more likely to choose debt as their primary hedging vehicle (**H2a**) is shown by the highly significantly positive coefficients on *NIDegree*. The negative coefficient on *se* indicates that the likelihood of the use of debt and debt-like

instruments increases following the increase in reporting transparency, consistent with **H2b**. Our findings also support **H2c**. The insignificant coefficients on *CumLoss* suggest that firms hedging cumulative losses use any vehicles available, either debt or derivative instruments, to achieve their target hedging level. On the other hand, the coefficients on *CumGain* interacted with *se* are significantly positive, suggesting a relatively higher likelihood of using debt (or lower likelihood of using derivatives) to hedge gains in the period before the reporting change. This would be consistent with firms using derivatives primarily in the presence of losses but not gains, suggestive of a more speculative hedging practice prior to mandated transparency.

[Insert Table 2.8 about here]

The use of debt also increases with geographic exposure as measured by *Dispersion*. All else equal, more dispersed firms are assumed to be more recognizable with greater access to foreign debt. In addition, our results show that firms with greater liquidity and profitability are less likely to use debt, suggesting a preference by these firms to avoid debt. Finally, the positive association between debt usage and leverage is consistent with highly levered firms exhibiting a preference for debt. These firms may be more likely to already employ debt in their financing of foreign subsidiaries, which can be designated as a hedge of this exposure.

5.6. **Robustness Tests**

5.6.1. **Alternative Variable of Reporting Change**

Since prior studies suggest OCI is only value relevant after ASU 2011-05, regardless of reporting format (Kim (2017)), we use an alternative model, replacing *se* with *ASU* (equal to one for the firm-year after the effective date of ASU 2011-05 and zero otherwise). Although not reported here, the results are similar to those discussed in sections 5.3 and 5.4 but with a lower significance level. That is, the decision to engage in NI hedging is persistent across the ASU

effective date. Similarly, the hedging level increases in the post-ASU period conditional on facing greater cumulative translation losses, supporting **H1a** and **H1c**. Both the decision to hedge and hedging level are positively associated with translation volatility, consistent with **H1b**. The lower significance level of the coefficients on *ASU* and its interaction with other variables relative to our original *se* suggests that the change in reporting location was the primary driver of the increased NI hedging level rather than an accounting pronouncement effective date.

5.6.2. **Alternative Measures of NI Degree**

To assess whether our results are sensitive to a particular measure of NI hedging level, we employ two alternative measures of *NIDegree.* First, since we were forced to make several assumptions to create the level of foreign assets due to missing data, we replace the denominator of foreign assets with foreign sales to create an alternative calculation of *NIDegree* as follows:

$$Alt\ NIDegree = \frac{Notional\ Total}{(Foreign\ sales\ ratio \times Total\ Assets)} \quad (4)$$

A second alternative *NIDegree* is constructed by replacing *FXAsset* with estimated foreign equity. The expectation is that firms are hedging net investment equity rather than foreign assets, thus foreign equity might be a more appropriate denominator. We have no data on foreign equity, so we estimate foreign equity using *FXAsset* times the firm's equity ratio, assuming foreign assets are financed similarly to the parent firm. Our results are qualitatively similar using both alternative measures of *NIDegree*.

Although not reported, testing the impact on the NI hedging level decisions with the alternative *NIDegree* measures, our main results hold qualitatively. Firms modify their hedging level in response to the mandated increase in reporting transparency and to cumulative losses that are suggestive of chronically weak currencies. In the alternative specifications using sales, the relation with geographic dispersion is negative and significant, which is consistent with some

diversification benefit leading to a reduction in hedging. While this relation makes sense, this finding is not robust to all measures of *NIDegree*.

5.6.3. **Endogeneity Concerns**

Identification of causal effects has garnered significant attention in recent accounting and finance research. Most researchers allude to the issues that confound identification as endogeneity, which can take two general forms: reverse causality and correlated omitted variables. We do not believe hedging policy leads to increased transparency since we observe firms that use NI hedging and reported OCI only within the SSE when allowed. To confirm that reverse causality is not an issue, we perform the same tests on the subsample of firms that change reporting location. For this subsample of firms, the statement transparency mandate represents an exogenous shock. Although not reported, our key results using this subsample are qualitatively similar.

To check whether our hedging participation and level models have missing variables, we use the Stata built in commands, *linktest* and *ovtest*, to provide evidence on whether our model is misspecified. The *linktest* is based on the premise that if a model is properly specified no additional independent variables should be significant above chance. The *ovtest* is used to test whether the right functional form has been used for the variables included in the regression. Both *linktest* and *ovtest* indicate no model misspecification.

5.6.4. **Sample Selection**

Our sample of S&P 500 firms includes both financial institutions and utilities. While not reported, our results are consistent when we exclude these firms. It is possible that our results might only hold for larger and more profitable firms. Our findings also suggest that the NI hedging decision is driven by both the level of exposure and means to minimize the impact of translation on CI. Our results should hold for comparable firms that have similar currency

exposure, size, and visibility, but may not apply to smaller firms, with limited translation exposure, and those not actively traded by nonprofessional investors. Only about a quarter of firms exhibiting translation exposure engage in NI hedging. Therefore, some of our primary results are based on a relatively limited number of discrete firms.

6. CONCLUSION

We make two important contributions to the literature. We investigate the impact of increased reporting transparency on NI hedging practice. Second, we explore why hedging firms are equally split between hedging exclusively with derivatives and hedging exclusively with debt.

While the likelihood of NI hedging appears to be persistent, we find evidence of an increase in the NI hedging level in the presence of ongoing translation losses following a change in reporting transparency. Both the decision to hedge and the level of hedging are significantly driven by the volatility of reported translation gains and losses, suggesting hedging as a tool for smoothing OCI reporting. Regardless of reporting location, our results suggest a positive relation between ongoing translation losses and a firm's decision to utilize NI hedges. This is suggestive of selective hedging as firms adopt a hedging strategy in the face of ongoing translation losses. While in conjunction with more transparent reporting we find no evidence of a switch to hedging associated with translation gains, there is some evidence suggesting firms already hedging this exposure increase the level to provide greater protection of translation gains.

Firms in our sample equally employ either foreign currency denominated debt or derivatives exclusively rather than using a combination of the two. We show that firms exhibit greater preference of using debt or debt-like instruments for NI hedging following a reporting change. When firms hedge more, they are more likely to use primarily debt. Moreover, firms use derivatives primarily in the presence of losses but not gains, suggestive of a more speculative

hedging practice before mandated transparency. Firms are more likely to use debt when they are more dispersed geographically, suggesting that part of the preference could be an indication of the firm's ability to obtain debt in general.

APPENDIX 2: Summary of Variables

Variable	Definition and Construction	Data Source
Dependent Variables		
NIHedge	Takes the value of one if the firm engages in NI hedge in the period, and zero otherwise	Hand collected from 10-K
NIDegree	The level of NI hedging, computed as the total *Notional,* amount of NI hedge outstanding at the fiscal year end, divided by *FXAsset.*	Hand collected from 10-K
DebtPortion	The notional amount of foreign currency-denominated debts (including cross-currency swap) designated as NI hedging divided by the total *Notional*	Hand collected from 10-K
Reporting Transparency		
se	A dummy variable that takes the value of one when OCI is reported in SE format in the period, and zero otherwise	Hand collected from 10-K
Translation Exposure		
Tran	The reported foreign currency translation adjustments, net	Compustat
VolTran	Volatility of *Tran,* calculated as the standard deviation of translation over previous 5 years scaled by standard deviation of net income over the same period	
TranGain	Current period reported translation gains, net	Compustat
TranLoss	Current period reported translation losses, net	Compustat
CumGain	Cumulative translation gains	Compustat
CumLoss	Cumulative translation losses	Compustat
FXAsset	Non-domestic identifiable assets. If missing, foreign assets are estimated using foreign long-lived assets or foreign property, plant, and equipment (PPE) and the ratio of total long-lived assets or total PPE over total assets.	Compustat Segments
FXRatio	The ratio of the foreign assets over total assets	
Dispersion	Geographic dispersion, calculated as ΣAiln(1/Ai), where Ai is the ratio of subsidiary i's assets to the firm's total assets	Compustat Segments
Control Variables		
EquityInc	Sensitivity of CEO's stock and stock option holdings to change in stock price, calculated as the effect of a 1%-point increase in firm's stock price on CEO's equity holding (1pct), scaled by total annual compensation computed as the sum of 1pct, cash salary and bonus	ExecuComp
Jsecurity	CEO job security that takes a value of 0, 1 or 2, constructed as the sum of two indicator variables: CEO-Director duality and insider-dominated board	ExecuComp
Employee	Log of thousands of employees	Compustat
AT	Log of firm total assets	Compustat
Leverage	Financial leverage, calculated as the total debt, including the current portion, divided by the total assets	Compustat
Liquidity	Cash and cash equivalent divided by the current liabilities	Compustat
ROA	Net income divided by the total assets	Compustat
OtherHedge	Takes the value of 1 if engaged in any other type(s) of hedging in the period and zero otherwise.	Hand collected from 10-K

Table 2.1 Summary Statistics

Panel A: Exposer Sample

	N	Mean	Min	p25	Median	p75	Max
se	1646	.273	0	0	0	1	1
NIHedge	1646	.184	0	0	0	0	1
Tran	1646	-138	-9317	-104	-15	5	6493
VolTran	1646	.612	0	.107	.301	.764	4.270
CumAdj	1646	-146	-14170	-124	-3	69	8784
lagCumAdj	1646	-7	-10668	-51	5	98	8784
FXAsset	1646	8265	7	699	2078	6617	188624
FXRatio	1646	.367	.002	.197	.351	.500	1
Dispersion	1646	.606	.015	.347	.549	.821	1.984
EquityInc	1075	.196	0	.079	.138	.225	1
Jsecurity	1376	1.395	0	1	1	2	2
Employee	1646	55	1	9	21	55	2300
AT	1646	22214	897	4669	9411	21476	349493
Leverage	1646	.240	0	.136	.215	.321	1.299
Liquidity	1646	.824	.015	.247	.529	1.022	8.208
ROA	1646	.073	-2.283	.042	.073	.112	.349
OtherHedge	1646	.857	0	1	1	1	1

Panel B: Hedger Sample

	N	Mean	Min	p25	Median	p75	Max
se	290	.269	0	0	0	1	1
NIHedge	290	1	1	1	1	1	1
NIDegree	290	.164	.002	.035	.100	.232	.850
DebtPortion	290	.507	0	0	.560	1	1
Tran	290	-316	-7220	-280	-66	0	6493
VolTran	290	.984	0	.178	.556	1.382	4.270
CumAdj	290	-502	-10668	-693	-84	97	5633
lagCumAdj	290	-186	-10668	-368	-11	146	5633
FXAsset	290	18582	210.978	2511	7444	22391	144000
FXRatio	290	.463	.064	.329	.456	.588	1
Dispersion	290	.717	.210	.367	.651	.941	1.615
EquityInc	171	.198	0	.088	.152	.273	1
Jsecurity	290	1.400	1	1	1	2	2
Employee	290	124	3	21	51	104	2300
AT	290	42087	1475	7473	17178	60277	290479
Leverage	290	.246	0	.163	.217	.296	.814
Liquidity	290	.696	.019	.226	.400	.826	4.895
ROA	290	.092	-.116	.054	.081	.128	.293
OtherHedge	290	.993	0	1	1	1	1

Notes: Table 2.1 presents summary statistics for the sample used for our examinations. Panel A summaries the exposer sample, covering S&P 500 firms with fiscal years ending from 2010 to 2015 representing 285 firms across the effective date of ASU with translation exposure and available data for all control variables. Panel B summaries the hedger sample, covering Exposer firms that engage in NI hedging in any given year, representing 72 firms with available data of notional amount for computing hedging level. *Tran*, *CumAdj*, *lagCumAdj*, *FXAsset*, *Employee*, and *AT* are raw data of translation adjustments, cumulative adjustments, lagged cumulative adjustments, foreign assets, number of employees, and total assets, respectively, without any scaling. All other variables are described in the Appendix 2.

Table 2.2 Pearson Correlation Coefficients

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) NIDegree	1															
(2) DebtPortion	0.641***	1														
(3) VolTran	0.147***	0.217***	1													
(4) CumGain	-0.044	-0.063*	0.014	1												
(5) CumLoss	-0.216***	-0.227***	-0.305***	0.296***	1											
(6) TranGain	-0.004	-0.011	0.073*	0.401***	0.154***	1										
(7) TranLoss	-0.155***	-0.195***	-0.363***	0.168***	0.672***	0.283***	1									
(8) FXRatio	0.091**	0.123***	0.140***	0.053	-0.215***	0.095**	-0.201***	1								
(9) Dispersion	0.075*	0.161***	0.128***	0.013	-0.224***	0.037	-0.179***	0.694***	1							
(10) EquityInc	0.017	0.022	0.001	-0.118***	-0.023	-0.082**	-0.006	-0.098**	-0.121***	1						
(11) Jsecurity	-0.032	-0.071*	-0.074*	0.073*	0.159***	0.028	0.127***	-0.013	-0.097**	0.126***	1					
(12) Employee	0.242***	0.212***	0.152***	-0.005	-0.098**	-0.018	-0.070*	0.212***	0.129***	0.109***	-0.050	1				
(13) AT	0.204***	0.180***	0.112***	-0.151***	-0.111***	-0.070*	-0.017	0.162***	0.171***	0.049	-0.128***	0.561***	1			
(14) Leverage	0.008	0.054	0.080**	-0.089**	-0.181***	-0.070*	-0.141***	-0.043	-0.006	-0.089**	-0.164***	-0.161***	0.008	1		
(15) Liquidity	-0.039	-0.074*	-0.247***	-0.086**	0.145***	-0.025	0.167***	-0.008	-0.074*	0.106***	0.100**	-0.293***	-0.136***	-0.135***	1	
(16) ROA	0.044	0.021	0.016	-0.043	-0.024	0.020	-0.001	0.097**	-0.010	0.079**	0.109***	0.127***	-0.017	-0.228***	0.111***	1

All variables are described in the Appendix 2. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2.3 Hedging Practice Summary

Panel A: Hedging practice by year

	Exposer Sample	Hedger Sample	Hedger Sample		
			Percentage of Exposer	Average Hedging Level	Average Debt Portion
2010	279	46	16.49%	13.15%	46.03%
2011	284	45	15.85%	14.78%	47.75%
2012	285	45	15.79%	15.35%	44.75%
2013	277	45	16.25%	18.97%	47.27%
2014	267	50	18.73%	14.85%	52.21%
2015	254	59	23.23%	20.52%	62.37%
Number of Firms 2010-2015	285	72	25.26%		
Firm-year Observations 2010-2015	1646	290		16.44%	50.68%

Panel B: Hedging practice in pre and post ASU periods

ASU		Exposer Sample	Hedger Sample	Hedger Sample		
				Percentage of Exposer	Average Hedging Level	Average Debt Portion
Total	Number of Firms	285	72	25.26%		
	Firm-year Observations	1646	290		16.44%	50.68%
Pre	Number of Firm	285	51	17.89%		
	Firm-year Observations	619	103		13.75%	46.90%
Post	Number of Firms	285	65	22.81%		
	Firm-year Observations	1027	187		17.92%	52.76%
Post - Pre	Number of Firms	0	14	4.92%		
	Firm-year Observations				4.17%**	5.87%

Notes: Table 2.3 presents summary statistics for the firms in our final sample. Exposer sample covers S&P 500 firms with fiscal years ending from 2010 to 2015 representing 285 firms across the effective date of ASU with translation exposure and available data for all control variables. Hedger sample includes Exposer firms that engage in NI hedging in any given year, representing 72 firms with available data of notional amount for computing NI hedging level. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 2.4 Hedger Subsample Summary and Differences in Means

	Hedger	Non-Hedger	Hedger-Non-Hedger
# of Firm-years	290	1350	
Changer	0.824	0.792	0.031
NIHedge	1.000		
NIDegree	0.164		
DebtPortion	0.507		
VolTran	0.984	0.534	0.452***
CumGain	0.006	0.007	-0.000
CumLoss	-0.019	-0.009	-0.010***
TranGain	0.001	0.001	0.000
TranLoss	-0.011	-0.006	-0.005***
FXRatio	0.463	0.347	0.117***
Dispersion	0.717	0.581	0.135***
EquityInc†	0.198	0.197	0.002
Jsecurity‡	1.400	1.391	0.009
Employee	3.886	2.956	0.929***
AT	9.940	9.145	0.794***
Leverage	0.246	0.239	0.007
Liquidity	0.696	0.853	-0.157**
ROA	0.092	0.068	0.023***

Notes: Table 2.4 presents segregated variable means and tests for differences in means between Hedgers vs. Non-Hedgers. The Hedger subsample includes firm-year observations that engage in NI hedging and have sufficient detail regarding notional amounts for each year they hedge. The Non-Hedger subsample exhibits no evidence of FX hedging although they report FX exposure. All other variables are described in the Appendix 2. †Only 171 and 898 firm-year observations in Hedger and Non-Hedger subsamples, respectively, have non-missing data for this variable. ‡Only 1080 observations in the Non-Hedger subsample have non-missing data for this variable. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 2.5 Participation Decision: Probability of Engaging in NI hedging

$$NIHedge_{it} = a + \beta_1 se_{it} + \beta_2 VolTran_{it} + \beta_3 CumGain_{it} + \beta_4 CumGain_{it}*se + \beta_5 CumLoss_{it} + \beta_6 CumLoss_{it}*se + \beta_7 Dispersion_{it} + \beta_8 Incentive_{it} + \beta_9 Size_{it} + \beta_{10} Leverage_{it} + \beta_{11} Liquidity_{it} + \beta_{11} ROA_{it} + \beta_{12} OtherHedge_{it} + \varepsilon \quad (1)$$

	(1) Exposer	(2) Exposer	(3) Exposer	(4) Exposer
se	0.030	0.015	0.018	0.063
	(0.073)	(0.072)	(0.075)	(0.087)
VolTran	0.099*	0.108**	0.103**	0.098*
	(0.058)	(0.054)	(0.052)	(0.054)
CumGain	-2.838	-1.873	-2.334	
	(4.830)	(4.692)	(4.577)	
*CumGain*se*	3.787	2.702	2.781	
	(4.656)	(4.484)	(4.517)	
CumLoss	-5.265**	-5.058**	-4.956**	
	(2.161)	(2.046)	(1.987)	
*CumLoss*se*	3.679	3.421	3.715	
	(4.929)	(4.537)	(4.417)	
lagCumGain				2.451
				(3.240)
*lagCumGain*se*				1.783
				(3.818)
lagCumLoss				-7.970**
				(3.251)
*lagCumLoss*se*				0.849
				(5.615)
TranGain				2.541
				(12.780)
*TranGain*se*				-6.463
				(19.101)
TranLoss				-5.338*
				(2.814)
*TranLoss*se*				11.424
				(7.427)
Dispersion	0.005	0.037		
	(0.137)	(0.126)		
FXRatio			0.653***	0.621**
			(0.245)	(0.246)
Jsecurity	0.073			
	(0.056)			
Employee	0.284***	0.301***	0.291***	0.304***
	(0.060)	(0.058)	(0.058)	(0.058)
leverage	0.577	0.315	0.388	0.393
	(0.373)	(0.373)	(0.390)	(0.401)
Liquidity	0.117**	0.131***	0.135***	0.137***
	(0.048)	(0.047)	(0.050)	(0.051)
ROA	0.564	0.517	0.528	0.510
	(0.369)	(0.343)	(0.357)	(0.339)
OtherHedge	0.686**	0.715**	0.677**	0.680**
	(0.289)	(0.290)	(0.301)	(0.302)
Observations	1376	1646	1646	1646
Pseudo R^2	0.145	0.145	0.151	0.147

Notes: Table 2.5 reports the results of model (1), which examines the determinants of a firm's probability of engaging in NI hedging. The dependent variable, *NIHedge*, is a dummy variable that takes the value of 1 if the firm engages in NI hedge during the period, and 0 otherwise. All other variables are described in the Appendix 2. We report standard error (clustered at the firm level) in parentheses. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 2.6 Level Decision OLS Results: Degree of NI hedging

$$NIDegree_{it} = a + \beta_1 se_{it} + \beta_2 VolTran_{it} + \beta_3 CumGain_{it} + \beta_4 CumGain_{it}*se + \beta_5 CumLoss_{it} + \beta_6 CumLoss_{it}*se + \beta_7 Dispersion_{it} + \beta_8 Incentive_{it} + \beta_9 Size_{it} + \beta_{10} Leverage_{it} + \beta_{11} Liquidity_{it} + \beta_{12} ROA_{it} + \beta_{13} Invmills_{it} + \varepsilon \quad (2)$$

	(1)	(2)
Se	0.027	0.010
	(0.042)	(0.040)
VolTran	0.056***	0.050***
	(0.012)	(0.012)
CumGain	3.191**	
	(1.294)	
*CumGain*se*	-3.775**	
	(1.588)	
CumLoss	-2.511***	
	(0.648)	
*CumLoss*se*	1.592**	
	(0.785)	
lagCumGain		2.161*
		(1.121)
*lagCumGain*se*		-2.341*
		(1.422)
lagCumLoss		-3.659***
		(0.758)
*lagCumLoss*se*		2.345*
		(1.271)
TranGain		9.078**
		(4.610)
*TranGain*se*		-6.773
		(6.421)
TranLoss		-1.090
		(0.904)
*TranLoss*se*		-2.805
		(2.560)
Dispersion	0.002	0.012
	(0.027)	(0.027)
Jsecurity	0.025	0.021
	(0.019)	(0.018)
Employee	0.101***	0.111***
	(0.021)	(0.019)
Leverage	0.140*	0.148**
	(0.073)	(0.069)
Liquidity	0.106***	0.107***
	(0.020)	(0.019)
ROA	0.279*	0.260
	(0.166)	(0.160)
Invmills	0.383***	0.395***
	(0.085)	(0.079)
Observations	290	290
R^2	0.193	0.220
F statistics	21.56	14.10

Notes: Table 2.6 reports the results of Equation (2), which examines the determinants of a firm's level of NI hedging for Hedgers, those engaging in some form of NI hedging in that reporting period. The dependent variable, *NIDegree*, represents the level of NI hedging, computed as the total notional value divided by *FXAsset*. *Invmills* is the Inverse Mills ratio obtained from Equation (1) to control for the potential sample-selection bias of the Hedger sample. All variables are described in the Appendix 2. Year fixed effects are included. We report standard error (clustered at the firm level) in parentheses. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 2.7. Mix of NI Hedge

	Hedger	Debt	Derivative	Debt-Derivative
Number of Firm-years	290	147	143	
Notional	2669.156	3376.169	1984.861	1391.308*
NIDegree	0.164	0.192	0.136	0.056***
VolTran	0.976	1.129	0.836	0.293**
CumGain	0.006	0.007	0.006	0.002
CumLoss	-0.019	-0.021	-0.016	-0.006*
TranGain	0.001	0.001	0.001	0.000
TranLoss	-0.011	-0.013	-0.009	-0.004**
FXRatio	0.462	0.470	0.456	0.014
Dispersion	0.715	0.778	0.653	0.125***
Employee	3.861	3.913	3.858	0.054
AT	9.923	9.860	10.023	-0.162
Leverage	0.245	0.274	0.218	0.056***
Liquidity	0.714	0.611	0.784	-0.173*
ROA	0.093	0.082	0.101	-0.019***

Notes: Table 2.7 presents segregated variable means and tests for differences in means between groups of firms with different levels of *DebtPortion*. Only firms that engage in NI hedging are included in these results. Firms in the Debt group (*DebtPortion* >0.5) use foreign currency denominated debt (including cross-currency swaps) for more than 50% of NI hedging; firms in the Derivative group (*DebtPortion* ≤0.5) use currency derivative contracts for at least 50% of NI hedging. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

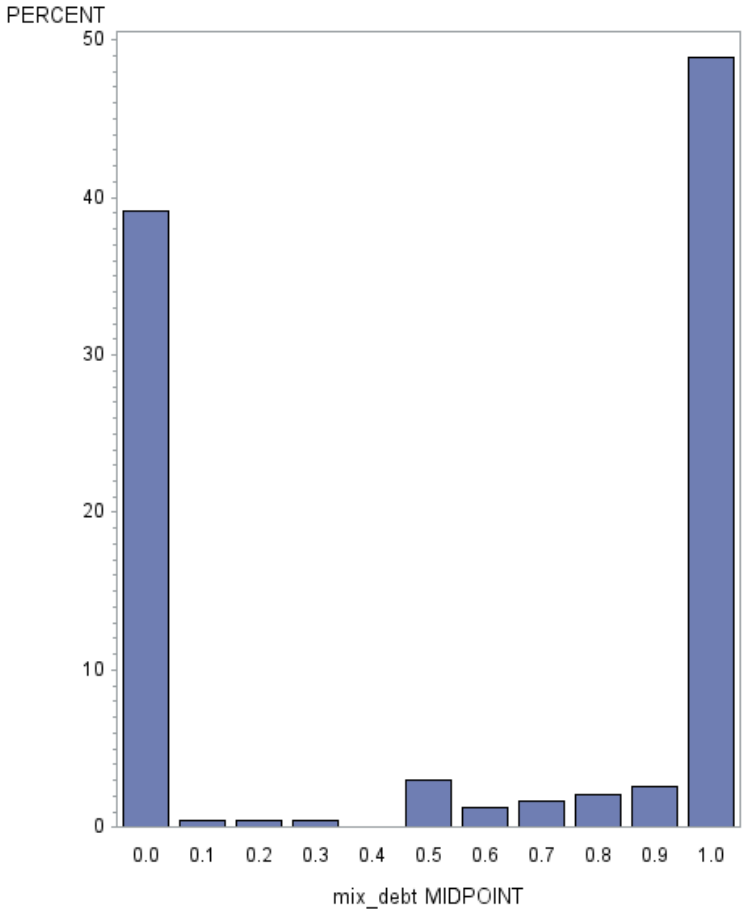
Table 2.8. Instrumental Variable Probit Estimates of Mix of NI Hedge

$$DebtUser_{it} = a + \beta_1 se_{it} + \beta_2 NiDegree_{it} + \beta_3 CumGain_{it} + \beta_4 CumGain_{it}*se + \beta_5 CumLoss_{it} + \beta_6 CumLoss_{it}*se + \beta_7 Dispersion_{it} + \beta_8 Incentive_{it} + \beta_9 Size_{it} + \beta_{10} Leverage_{it} + \beta_{11} Liquidity_{it} + \beta_{12} ROA_{it} + \beta_{13} Invmills_{it} + \varepsilon \quad (3)$$

	(1)	(2)
se	-0.618**	-0.530*
	(0.265)	(0.298)
NIDegree	4.928***	5.441***
	(1.168)	(0.990)
CumGain	-15.060	
	(11.737)	
*CumGain*se*	41.030***	
	(14.738)	
CumLoss	5.118	
	(5.108)	
*CumLoss*se*	-7.953	
	(7.086)	
lagCumGain		-7.716
		(9.708)
*lagCumGain*se*		20.735
		(13.004)
lagCumLoss		9.601
		(6.252)
*lagCumLoss*se*		-6.148
		(12.030)
TranGain		-78.753**
		(33.666)
*TranGain*se*		137.417***
		(47.617)
TranLoss		3.052
		(7.344)
*TranLoss*se*		16.609
		(19.224)
Dispersion	0.590***	0.495**
	(0.221)	(0.220)
Jsecurity	-0.106	-0.079
	(0.147)	(0.140)
Employee	-0.019	-0.139
	(0.160)	(0.170)
Leverage	1.406**	1.065
	(0.700)	(0.700)
Liquidity	-0.380***	-0.438***
	(0.145)	(0.139)
ROA	-2.977**	-2.919**
	(1.389)	(1.315)
Invmills	-0.026	-0.283
	(0.590)	(0.591)
Observations	290	290
Pseudo R^2	0.153	0.126

Notes: Table 2.8 presents the IV Probit estimates for Equation (3). The dependent variable, *DebtUser*, takes the value of one if the firm is a primary debt user (debt use is more than 50 percent of NI hedges, that is, *DebtPortion* > 0.5) and zero if the firm is a primary derivative user (*DebtPortion* ≤ 0.5). Only the firms that engage in NI hedging are included. *Invmills* obtained from the Heckman first stage Probit Equation (1) is included to correct for the potential self-selection bias of being a NI hedger. We report standard error (clustered by firm) in parentheses. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0$.

FIGURE 1 Mix of NI Hedge



Notes: The figure shows the distribution of *DebtPortion*. *DebtPortion* is the proportion of notional amount of debt in NI hedging over total notional amount of NI hedging. A value of 1 indicates that the firm uses only foreign-currency denominated debt or currency swaps that mimic debt. A value of 0 indicates that the firm uses only derivatives for net investment hedging. Values between 0 and 1 represent a mixture of debt and derivatives for net investment hedging. Only firms that engage in net investment hedging are included in these results.

Chapter 3

Decomposing Translation Adjustments: Investors and Managers Response

1. INTRODUCTION

According to General Accepted Accounting Principle (GAAP), changes in equity from non-owner sources, typically net income, are reported in income statements. However, some special items do not meet the realization principle of revenue recognition and thus bypass the income statement and will be reclassified to income in the future. These items have been required to be reported as Other Comprehensive Income (OCI), separated from other equity items, since Statement of Financial Accounting Standards (FAS) 130 (FASB, 1997) was issued in 1997[4]. As one of major OCI items, foreign currency translation adjustments (translation hereafter) measures translation exposure, which results when a company has a consolidated foreign subsidiary that reports in a currency other than the parent. When a subsidiary's reporting currency depreciates during the fiscal year, the book value of the subsidiary on its parent company's consolidated balance sheet will decrease after translating into its parent's reporting currency. This results in a translation loss. If a subsidiary's reporting currency appreciates during the year, a translation gain is reported. Since these gains and losses do not impact company's cash flow unless the subsidiary is liquidated, they do not meet the criteria for income recognition and thus are reported as a part of OCI. Translation gains and losses may also be offset from year to year because of the fluctuation of exchange rates. Hence, translation adjustments are potentially largely transitory in nature.

[4] International Accounting Standards define and require the presentation of OCI similarly.

The extant literature suggests that OCI items, including translation, are value relevant. Consistent with the belief that this information was useful to investors, Accounting Standard Update (ASU) 2011-05[5] promotes the prominence of OCI information with the objective to "improve the comparability, consistency, and the transparency of financial reporting" (FASB, 2011). On the other hand, if translation is potentially transitory it should have little value implication. The question then becomes, why would accounting authorities promote its transparency and should investors price this information? A reasonable conjecture might be that it contains information that reflects a long-term impact on firm value, in other words, it is not entirely transitory.

The purpose of this study is to explore the source of value relevance of translation and management's reaction to the reported translation. This study concentrates on translation for two reasons. First, translation is one of the largest OCI items. Exchange rates are determined by the relative economic conditions (changes in interest and inflation rates) between each pair of countries or currency regions. In normal economic conditions, real exchange rates should be self-correcting with close to zero mean. However, if relative economic conditions between the two countries are fundamentally different the impact may be long-lasting. On the other hand, some portion of translation is offset in future years and is truly transitory, only impacting CI on a temporary basis, suggesting it should have little value implication. Second, translation adjustments are due to exchange rate movements and is generally out of managers' control. One way they may manage the risk associated with uncontrolled exchange rate movements is to hedge net foreign assets to smooth reported translation and to protect income in the event the subsidiary is liquidated in the future. Hedging reduces the volatility of reported translation since

[5] Financial Accounting Standard Board (FASB) issued Accounting Standard Update No. 2011-05: Comprehensive Income (Topic 220) Presentation of Comprehensive Income on June 2011 (FASB, 2011a).

net investment hedging gains and losses offset translation losses and gains and reduces the potential for large translation losses from a subsidiary that may be liquidated due to ongoing local currency weakness. Managers make their decisions on hedging practice to manage the risk associated with uncontrolled exchange rates. By decomposing translation into its temporary and long-term portions, I find that value relevance is mainly loaded on the long-term portion while the temporary portion has limited impact on investors' return or managers' risk management decision.

This study makes two contributions to the literature. It is the first study I am aware of that decomposes the translation into its long-term and temporary portions. The long-term portion, measured as the rolling average of translation over five years, remains unreversed until the foreign subsidiary is liquidated. Prior research finds that investor returns are significantly associated with translation information. My results show that investors appear to identify the impact brought about by the long-term portion of translation and impound the information in pricing the stock. The transitory or temporary part, on the other hand, has limited impact on investor evaluation. This finding suggests that contrary to some managers' concern, investors are not confused by transitory translation but impound only the value relevant information. Therefore, accounting authorities have been right in promoting transparent reporting of OCI information.

The second contribution comes from examining whether management is aware of the different impacts of the long-term and temporary portions of translation and adjust their risk management decisions accordingly. I find that managers are mainly sensitive to the impact associated with the long-term component and adjust their hedging practice in response. I also find that managers increase the use of net investment hedging (NI hedging) when their firm faces

long-term translation losses. This finding suggests that managers selectively adjust their NI hedging practices when experiencing a long-term trend of unfavorable exchange rate movement.

The remainder of the article proceeds as follows: the next section summarizes relevant literature on value relevance of OCI and the association of hedging practice and OCI reporting; the third section presents the development of my hypotheses; the fourth section describes the data selection, research design, and variable construction; the fifth section presents the main results along with robustness checks; and the final section provides our concluding remarks.

2. PRIOR LITERATURE

Prior studies have looked at the value relevance of OCI and its component translation, and its impact on managerial behavior. Further, the extant literature regarding hedging practice is also relevant to this study.

2.1 The value relevance of OCI and its component translation

Since the implementation of FAS 130 in 1997, firms have been required to report the accumulated balance of OCI as a separate item in the equity section of the Balance Sheet and classify items of OCI by their nature in the Statement of Change in Shareholders' Equity. Earlier research on the value relevance of OCI and its separate components has been mixed. Some studies find that OCI information does not help investor assessments of firm risk and value. Ohlson (1999) shows that OCI is a different source of earnings from core sustainable earnings. It is transitory because it is irrelevant for forecasting next-period abnormal net comprehensive income and irrelevant for predicting future value. Dee (1999) demonstrates that the unrealized gains and losses that make up OCI are transitory, that is, approaching to zero mean over time, and are thus poor predictors of future value. Dhaliwal, Subramanyam and Trezevant (1999) finds no evidence that comprehensive income is more strongly associated with returns than net

income. The nature of translation, which fluctuates with exchange rates that is uncorrelated through time in an efficient market and may never be realized to hit net income unless the foreign subsidiary is liquidated, should support the irrelevance claim, as Collins and Salatka (1993), Soo and Soo (1994) and Bartov (1997) show in their studies and have little economic significance as stated by Huefner, Largay, and Hamlen (2010).

In contrast, other studies have found OCI items to be value relevant. Numerous studies have shown that investors price the OCI items (Pinto (2005), Chambers et al. (2007), Kim (2017)). Cahan, Courtenay, Gronnewoller, and Upton (2000), Lin, Martinez, Wang, and Yang (2018) and Biddle and Choi (2006) all provide evidence that OCI information is decision useful for investors. Further, Hirst and Hopkins (1998) suggest analysts' valuation judgments are affected by the information related to OCI. Bartov (1997) finds that SFAS No. 52 represented a significant improvement in the valuation relevance of foreign currency translation reporting over SFAS 8 which required translation adjustments to be included in income statements. Chambers, Linsmeier, Shakespear and Sougiannis (2007) find that two OCI items, foreign currency translation adjustment and unrealized gains/losses on available-for-sale securities, are priced by investors after FAS 130 which created OCI reporting. Pinto (2005) also found that OCI, of which foreign currency translation adjustments are the largest, is a significant source of value relevant information for investors.

Most studies supporting value relevance of translation (as referred above) find a positive relation between translation and firm value. This is because in general, appreciation (depreciation) of the reporting currency of subsidiaries increases (decreases) the book value of net assets on the parents' consolidated balance sheet under the current rate method, reflected by a positive (negative) translation. However, arguments that translation might be informative,

reflecting economic conditions in the related countries/currency regions, suggests a possibility that the translation may be priced by the market as it conveys value relevant information. Louis (2003) shows empirically that for manufacturing firms the translation adjustment is negatively priced due to the economic effect of rigidity of inputs in open market conditions. That is, translation gains may indicate an increase in production costs thus having a negative impact on future foreign income.

Other studies have examined whether the reporting of OCI losses versus gains is more relevant to investors. A study by Kim (2017), using the S&P 500 as their sample, shows that negative OCI is incrementally more value relevant and concludes that investors process information in OCI more than normally assumed. Bazaz and Senteney (2001), focuses on the translation, similarly find that translation losses have greater impact than gains when being valued by investors.

2.2 Managerial behaviors related to OCI reporting

Literature has shed some light on managerial response to OCI reporting. Wang and Men (2013) find earnings management was significantly negatively related to OCI. Graham and Lin (2018) document that current year OCI is significantly related to future discretionary financing, investing, and operating expenditures. Biddle and Choi (2006) suggest that managers are hesitant to report OCI items over which they have no control, like translation gains and losses. Since NI hedging reduces translation volatility, it may be used as a tool to manage currency risk in response to market reaction associated with the translation adjustment. As Chapter 2 shows, managers increase the use of NI hedging when experiencing ongoing translation losses.

2.3 Determinants of currency hedging

Barton, 2001 and Pincus and Rajgopal, 2002 suggests discretionary accruals and derivative hedging as partial substitutes in smoothing earnings. Géczy, Minton, and Schrand (1997) report significant relations between hedging and greater investment opportunities and tighter financial constraints proxied by the use of leverage. Bonini, Dallocchio, Raimbourg, and Salvi (2016) show that half of firms exposed to translation risk actively manage this risk, and such risk management is persistent in the long term. According to Guay and Kothari (2003), more geographic dispersed firms are more likely to hedge their currency disposure with derivatives.

3. HYPOTHESES DEVELOPMENT

3.1 Value implications of reporting OCI

Accounting authorities have been requiring firms to report OCI more transparently and prominently, from FAS No. 130 (FASB, 1975) to ASU 2011-05 (FASB, 2011). Although net income remains the primary measure and indicator of firm profitability, they believe OCI not only improves the reliability and transparency of financial statements, but also assists the users of financial statements in assessing firm activities, understanding the dynamic of foreign operations, and forecasting timing and magnitude of future cash flows (FAS 130), therefore is value relevant.

If translation as one of major OCI items is truly fluctuating with no predictability and is transitory in nature, it should have limited value implication because transitory gains and losses could reverse in the future or never be realized. Managers have expressed concern that OCI items only distract investors' attention from correct valuation. Over 70 percent of comment letters responding to the exposure draft of ASU 2011-05 expressed concern over greater prominence of OCI confusing investors. Then the question is whether the correct portion of the translation is

priced by investors in valuation? A reasonable conjecture is that translation is not entirely transitory and a portion has a long-lasting impact on future income, thus becoming a source of value relevance. The remaining transitory or temporary portion, on the other hand, should not influence firm valuation. Therefore, I hypothesize that the source of the value relevance is only the long-term component of translation, the rest is transitory and should have little or no impact on firm value. A favorable trend of exchange rate movement will result in a long-term translation gain, while long-term losses suggest chronically weak currencies of foreign investments. On the other hand, as suggested by Louis (2003), translation gains may indicate an increase in production costs with a negative impact on future foreign income. Although I cannot predict the sign of the coefficient on long-term translation given the mixed results from the literature, I hypothesize the following:

H1: *Investor returns are significantly associated with the long-term portion of translation and not related to the temporary portion.*

3.2 Hedging decision - participation and level

The second purpose of this study is to examine whether managers perceive the different impacts of the long-term and temporary portions of translation and adjust their related hedging practice accordingly. If a firm engages in NI hedging, the hedging results will offset part of translation gain or loss thus smoothing the reported translation. Hence, the purposes of NI hedging can be 1) to reduce the volatility of current period translation reported as an OCI item and 2) to reduce the potential of significant losses if subsidiaries with chronically weak reporting currencies are ultimately liquidated. If managers believe that investors are unable to differentiate transitory translation and focus too much attention on these more volatile reported results in OCI, managers will respond by hedging both portions of translation. Even though they are more

inclined to reduce the potential long-term losses, they may still worry about the investor distraction related to translation fluctuations.

***H2a**: Firms with higher levels of translation, TranTemp and TranLong, are more likely to engage in NI hedging.*

***H2b**: Firms with higher levels of translation, TranTemp and TranLong, engage in a higher level of NI hedging.*

If managers are aware that investors can distinguish the transitory portion of translation, managers are motivated to design their hedging program in response to only the long-term component to reduce the impact of potential liquidation of subsidiaries with chronically weak currencies (ongoing long-term translation losses). Consistent with Bazaz and Senteney (2001), Kim (2017) and Bernstein (1993), I expect firms with substantial long-term translation losses will be more incentivized to engage in NI hedging and hedge more. This leads to H3:

***H3a**: The likelihood of engaging in NI hedging is increased with greater long-term translation losses but not with greater long-term translation gains.*

***H3b**: The level of NI hedging is increased with greater long-term translation losses but not with greater long-term translation gains.*

4. DATA AND RESEARCH DESIGN

4.1 Sample Selection

The sample period runs from 2013 to 2019, because ASU 2011-05, which mandated transparent and prominent OCI reporting starting fiscal year 2012. The sample includes all firms with translation exposure and complete data for the regression testing value relevance. I start with Compustat Fundamental Annual Dataset, obtaining OCI and all OCI components data, as well as other accounting data needed for regression controls. Then the Compustat data is merged with

CRSP to obtain returns data. My full sample of 1,366 firms with 5,206 firm-year observations. This is the sample used for testing H1 return hypotheses.

For hedging data, I hand collect from firms' 10-Ks for S&P 500 firms, a subsample of my full sample, for the same period. S&P 500 firms were chosen because most have both translation exposure and the necessary personnel to manage translation risk. All firms included in the S&P 500 at any time during my sample period were included to avoid survivorship bias, resulting in 667 index constituents. I drop 61 firms that had significant changes in ownership for any reason (IPO, spinoffs, significant mergers and/or acquisitions, etc.), resulting in 558 firms in my initial hedging sample.

Hand-collected hedging data includes each sample firm's hedging policy, notional value of net investment hedging, and the impact on OCI using the footnotes to the financial statements, either narrative or tabular. I use Compustat Historical Segment data, which provides some accounting data by geographic segments, to identify the level of translation exposure in terms of foreign assets. There are 116 firms with no evidence of translation exposure. Due to missing Compustat Historical Segment or other data needed in constructing variables, the subsample used for testing hypotheses regarding NI hedging consists of 303 firms with 1722 firm-year observations that are exposed to translation risk. Among the 303 firms with translation exposure, 56 firms with 313 firm-year observations actually engage in NI hedging.

4.2 Value implications of reporting translation

In order to test H1, that investors are able to identify and price only the long-term translation, I first decompose the translation into long-term and temporary portions. The long-term portion, *TranLong*, is computed as the historical moving average translation over five years, including the current year. The temporary portion, *TranTemp*, is the difference between total translation and

TranLong. I hypothesize that stock returns reflect the long-term translation, but the temporary portion is not priced by investors (H1). I utilize the following model to examine the value relevance of the translation, adapting the methodology used in Chambers (2007), Kim (2017) and Lin, et al. (2018):

$$RET_{i,t} = a + \beta_1 NI_{i,t} + \beta_2 Loss_{i,t} * NI_{i,t} + \beta_3 TranTemp_{i,t} + \beta_4 TranLong_{i,t} + \beta_5 OCInotran_{i,t} + \beta_6 Growth_{i,t} + \beta_7 Tasset_{i,t} + \varepsilon_{i,t} \quad (1)$$

I measure *RET* as the buy-and-hold raw return for the window eight months before to four months after the firm's fiscal year-end. *NI* is the net income after extraordinary items and discontinued operations scaled by the market value of common shares outstanding at eight months before the fiscal year-end; *LOSS* is a dummy variable equal to one if a firm reports net loss, and zero otherwise; *Tran* is the translation reported for the current period in OCI; *OCInotran* is the rest of OCI (excluding *Tran*), scaled by the market value of common shares outstanding at eight months before the fiscal year-end. *TranLong* and *TranTemp* are as previously defined. All variables derived from translation, including *Tran, OCInotran, TranTemp* and *TranLong*, are scaled by the market value of common shares outstanding at eight months before the fiscal year-end in this section. Growth in sales (*Growth*) and log of total assets (*Tasset*) are included as control variables. Standard errors are clustered at firm level. Industry and year fixed effects are included to control for heteroscedasticity and the potential of serial correlation in errors terms between industries and across years for macroeconomic variations.

A significant coefficient on *TranLong* (β_4) will support H1. In addition, further investigation on whether investors pay more attention to translation losses than gains can be conducted by splitting *TranTemp* and *TranLong* into positive and negative values. I expect the negative

TranLong to be more significant, capturing more investors' attention as suggested by the prior studies.

4.3. NI hedging participation

Next, I examine whether firms relate their currency hedging practice more to the long-term translation gain/loss than to the temporary portion (H2 and H3). The S&P 500 subsample is used in this section. Following the previous studies (Adkins, Carter, & Simpson (2007), I examine both the decision to engage in NI hedging (participation) and the degree of NI hedging (level) using the Heckman (1979) two-stage model. Because firms self-select to hedge their currency exposure or not, ordinary least squares (OLS) regressions may be subject to potential sample selection bias. The Heckman model is designed to address this concern. In the first stage, I examine the hedging choices, *NIHedge*, participation decisions of NI hedging, with the following Probit model:

$$NIHedge_{i,t} = a + \beta_1 TranTemp_{i,t} + \beta_2\, TranLong_{i,t} + \beta_3 DollarVol_{i,t} + \beta_4 FXExposure_{i,t} + 5_6 EM_{i,t} + \beta_6 Tasset_{i,t} + \beta_7 Leverage_{i,t} + \beta_8 ROA_{i,t} + \beta_9\, OtherHedge_{i,t} + \varepsilon_{i,t} \quad (2)$$

I model the probability of NI hedging (participation) as a function of current period translation decomposed as *TranTemp* and *TranLong* as defined previously but scaled by foreign assets in this section, exchange rate volatility, level of translation exposure, and other control variables following the literature to test H2a. I expect a higher probability of NI hedging associated with *TranLong* to support H2a. *TranLong* then be segregated further into *TranLongGain* and *TranLongLoss* for testing H3a. A significantly negative coefficient on the all-negative *TranLongLoss* variable is expected in support of the selective hedging hypothesis H3a.

The dependent variable, *NIHedge*, indicates the probability of participating in NI hedging. Dollar volatility, *DollarVol*, calculated as the standard deviation of dollar index (broad, monthly

trade-weighted U.S. Dollar Index), over the previous five years, is used to measure exchange rate fluctuations. In addition to *DollarVol*, I use geographic dispersion (*DispersFX*) to capture translation exposure. *DispersFX* captures how the firm's foreign assets are spread in more countries with potentially different currencies. Following Guay and Kothari (2003), *DispersFX* is calculated as $\Sigma A_i \ln(1/A_i)$, where A_i is the ratio of subsidiary *i*'s assets, *FXAsset*, to the firm's total assets, suggesting the importance of each subsidiary. As an entropy measure, *DispersFX* is considered both the number of foreign subsidiaries and the asset weight of each subsidiary relative to the firm's total assets, capturing the multidimensional nature of geographic dispersion. *FXAsset* is identifiable non-domestic assets. For firms missing this item, I obtain non-domestic long-lived assets or non-domestic property, plant, and equipment (PPE), and then use the ratios of long-lived assets/PPE over total assets computed from the balance sheets to estimate non-domestic total assets. For example, if a firm's PPE ratio (PPE over total assets) is 50 percent, and its non-domestic PPE is $10 million, *FXAsset* will be estimated as $20 million. In an alternative specification of Equation (1), *FXRatio*, the ratio of *FXAsset* over the firm's total assets, is used as a simpler measure of translation exposure.

Guay and Kothari (2003) show a positive relation between geographic dispersion and the use of derivatives. However, the relation can be complicated if focusing on translation exposure and related NI hedging. The more dispersed a firm's subsidiaries, the more significant the firm's level of translation risk, and the more likely it would engage in NI hedging. On the other hand, if a firm spreads its subsidiaries in different currency regimes, it is possible to diversify the firm's currency risk to some degree. Thus, a high level of dispersion could lead to a lower level of NI hedging.

I also include the recent tendency to smooth earnings for control purpose. Managers with tendency to smooth net incomes may be inclined to smooth reported OCI as well thus more likely to employ NI hedging. *EM*, representing the high tendency of earning smoothing, is the average of discretionary accruals (*DA*) over previous 3 years if above median level of 3-year average *DA*. For firm-years with blow median level of 3-year average *DA*, *EM* is set to be zero. *DA* is discretionary accruals calculated using the performance adjusted modified Jones model (Kothari, Leone and Wasley, 2005). Standard errors are clustered at the firm level to control for heteroscedasticity and serial dependence.

Firms that have greater experience with other types of hedges may be more likely to engage in NI hedging. *OtherHedge*, which equals one if a firm engages in any other type(s) of hedging, including commodity hedging, interest rate hedging, or other currency hedging not against net foreign assets, and zero otherwise. If a firm engages in other types of hedging activities, then I assume they have no policy restriction on hedging activities.

4.4. NI hedging level

The second stage of the Heckman model test the level decision, the degree of NI hedging, as shown the following:

$$NIDegree_{i,t} = a + \beta_1 TranTemp_{i,t} + \beta_2\ TranLong_{i,t} + \beta_3 DollarVol_{i,t} + 4_5 DisperFX_{i,t} + \beta_5 EM_{i,t} + \beta_6 Tasset_{i,t} + \beta_7 Leverage_{i,t} + \beta_8 ROA_{i,t} + \beta_9 Invmills_{i,t} + \varepsilon_{i,t} \quad (3)$$

NIDegree captures the level of NI hedging activity, computed as the total notional amount of NI hedges outstanding at the fiscal year end scaled by the firm's total foreign assets. The notional value includes contractual foreign currency net investment hedges, including currency swaps used to mimic debt, and foreign currency-denominated loans. For firms that report

notional values only in foreign currency, I convert the amounts into US dollar based on the exchange rate in effect at the fiscal year-end month.

At this stage, sample firms will be limited to those firms choosing to hedge translation exposure, NI hedgers. Heckman correction is applied in this stage, that is, including the inverse mill ratio (*Invmills*), calculated from the first stage Probit regression Equation (2), with *OtherHedge* serving as the exclusion variable since it proves to be significantly related to the decision to hedge and should have no impact on the target hedging level. Not all firms that hedge translation exposure are included in the second stage. For firms reporting notional value aggregately, that is, total notional value for different types of currency hedges, I cannot get the actual value for constructing *NIDegree.* I treat these observations as missing for *NIDegree,* but they are assigned a value of one for *NIHedge* if the firm clearly states that they engaged in NI hedging activities in that period. Otherwise, the control variables are the same as those used in the first stage regression. Again, I control for industry and year fixed effects and cluster standard errors at the firm level.

5. RESULTS

5.1 Descriptive Statistics

Table 3.1 provides descriptive statistics for the samples used for different tests. Panel A shows that the average sample firm reports a OCI loss of 17.5 million, a loss that is sufficient to drag total comprehensive income down by more than 5% if it is taken into account together with net income by investors in their valuation. This might explain why managers are concerned that investors might be distracted from net income in assessing their performance. The reported translation, if separated from OCI, shows a mean loss of 24.5 million, is the largest item contributing to OCI. After decomposing, it appears most of the translation loss comes from long-

term portion (*TranLong*), 23.8 million on average. This loss is equivalent to 7.3% of net income in magnitude. The temporary portion (*TranTemp*) has a very small mean, -0.7 million, because it fluctuates and offsets due to its transitory nature.

Panel B provides a summary of the NI hedging subsample, which consists of 303 firms or 1,722 firm-year observations that are constituent firms of S&P 500 and have translation exposure, used for examining NI hedging decision. These firms, on average, have 37.4% of their assets dispersed outside of US with 0.613 dispersion level using entropy measure. All variables derived from translation, including *Tran, OCInotran, TranTemp* and *TranLong*, are scaled by foreign assets. Average long-term translation losses reduce 4% of the value of firms' foreign assets. This is fairly substantial considering the overall profit over total assets is 7% (*ROA*). The transitory portion, on the other hand, represents only 0.4% of foreign assets, hence I expect limited value relevance. Of 1722 *TranLong* observations, 1477 observations (85.8%) are negative, suggesting that most sample firms have experienced chronic translation losses during the sample period. The result shows that only 20.2 percent of firms in this sample choose to hedge their foreign net assets, displayed in Panel C. These firms, on average, hedge 16.8% of their foreign assets. Among firms that engage in NI hedging, more than 90% of firm-year observations (283 over 313 firm-year observations) report translation losses averaging 1.9% of foreign assets, while only 30 firm-year observations among this sample report an insignificant gain.

Correlation tables of main variables on the full sample and NI hedging subsample are presented in Table 3.2.

[Insert Table 3.1 about here]

[Insert Table 3.2 about here]

5.2 Value implications of OCI reporting

I first examine the value relevance of translation using the full sample. Before testing the decomposed translation, I start with replicating the Lin et al. (2018) investigation on OCI value relevance. As shown in Table 3.3 column (1), OCI information is relevant to investor returns, consistent with Lin et al. (2018) study. In column (2), OCI is segregated into translation (*Tran*) and other components (*OCInotran*). The result shows that investors significantly impound *Tran*, as suggested by Chambers et al. (2007). Since about 65% of *Tran* observations are negative, the positive coefficient on *Tran* suggests that investors devalue firms more with higher translation losses. My entire sample period falls after ASU 2011-05, when all firms are mandated to report OCI transparently. It is not surprising that the coefficients of *OCI* and *Tran* in column (1) and (2) are fairly significant as this information is now clearly visible allowing investors to process OCI information and impound it in their valuation.

Column (3) demonstrates the result of the main model of this section, equation (1). As described before, *Tran* is decomposed into temporary portion, *TranTemp*, and long-term portion, *TranLong*. The coefficient on *TranLong*, β_4, is highly significant and positive. The results clearly show that the significant relation between translation and investors returns is largely loaded on its long-term portion, in support of H1.

[Insert Table 3.3 about here]

In column (4), I further split *TranLong* into positive and negative values, *TranLongGain* and *TranLongLoss*. As expected, only *TranLongLoss* matters, suggesting that investors only impound translation information when they perceive a long-term loss due to unfavorable exchange rate movement. The other components of OCI, *OCInotran*, is not significant across specifications, inconsistent with prior research finding that OCI components affects pricing when

reported transparently (Chamber et al., 2007). Given the fact that *OCInotran* consists of more than one major components of OCI, the influence of each component may not work in the same direction.

In summary, I find sufficient evidence to support my hypotheses regarding long-term translation. My results are consistent with previous research findings that OCI information is value relevant. I show that the value relevance is mainly attributed to the long-term component of translation, while the remaining transitory portion has little value implication. The results also suggest that long-term translation losses concern investors the most.

5.3 Currency hedging participation and level

Using a Probit regression (2), I examine the likelihood of engaging in NI hedging as the first part of the Heckman two-stage model. Results are shown in Table 3.4. The NI hedging subsample consists of S&P 500 firms that report nonzero translation gains/losses, during the period of 2013-2019. I find significant association between *TranLong* and the likelihood a firm would engage in NI hedging. Since *TranLong* is dominated by losses, a negative sign on coefficient for a loss dominated *TranLong* (β_2) supports H2a, suggesting that managers are incentivized to engage in NI hedging when they see chronic long-term translation losses. Meanwhile, it appears that managers are less likely to hedge temporary fluctuations in translation (*TranTemp*). Managers specifically seem be less likely to engage in NI hedging of temporary translation gains, as suggested by column (3) coefficients on segregated *TranTempGain* and *TranTempLoss*. In column (2) I replace geographic dispersion with a simple alternative measure, *FXRatio*, to control for translation exposure. The result holds qualitatively the same.

[Insert Table 3.4 about here]

In the second stage, OLS regression (3) is utilized to investigate the NI hedging level decision. Only firms exposed to translation risk and engaged in NI hedging (NI hedgers) are included in this stage. Since firms self-select to be in this small sample of NI hedger, the Heckman correction procedure is applied by including the *Invmills* obtained from the first stage Probit regression (2) and excluding the *OtherHedge* variable which serves as exclusion variable in this model. Results are presented in Table 3.5. An insignificant *Invmills* suggests the concern about sample selection bias may not be necessary. Evidence suggests that NI hedging level is also driven by long-term translation (*TranLong*) which is dominated by losses, but not *TranTemp*, partially consistent with H2b. Firms facing unfavorable translation adjustments over a long period of time hedge more.

[Insert Table 3.5 about here]

In summary, evidence supports H2a and part of H2b, that firm's decision to hedge and level of hedging are both significantly influenced by long-term translation, but the transitory/temporary portion has only limited impact on the decision to hedge. In addition to the main question of this part, results also show that foreign assets exposure, as measured by either DispersFX or *FXRatio*, is another key factor in the NI hedging decision. Also, large, profitable firms that already engage in some types of hedging are more likely to engage in NI hedging.

5.4 Evidence of selective hedging

To test H3, that managers are driven to hedge primarily by long-term translation losses, I split the *TranLong* into *TranLongGain* and *TranLongLoss*, replace *TranLong* in column (3) regression of Table 3.4 and column (2) of Table 3.5. A strong relation between *TranLongLoss* and NI hedging activities is evident in both the decision to hedge and level of hedging. The negative coefficients are only on *TranLongLoss* but not on *TranLongGain*, suggesting that long-

term translation losses encourage managers to engage in NI hedging and hedge more, as suggested by prior research. Thus, H3a and H3b are supported.

5.5 Robustness check

I apply various alternative measures in the study to ensure that my main results are not sensitive to a particular construction of key variables. First, in decomposing translation, I alternatively compute the *TranLong* as 3-year rolling average instead of 5-year window and all results hold qualitatively. I choose a 3-year window for decomposing because investors can normally compare 3 years accounting data displayed in the face of financial statements of each year. Therefore, investors are likely to perceive the trend easily and impound the information accordingly.

Another dependent variable subject to variation in construction is net investment hedging level (*NIDegree*). Due to missing data in determining foreign assets, I replace the scaler with foreign gross profit. With the alternative *NIDegree* employed in the model, main results that managers increase the use of NI hedging in response to long-term translation loss hold.

Several key independent variables are replaced with their alternative measures for the purpose of robustness check. *FXRatio* is used as a simple alternative of geographic dispersion for measuring foreign currency exposure. In results not reported in this paper, I utilize different measures of earnings management and firm size. The findings I present in this paper are not sensitive to these alternative variables.

The NI hedging sample comprises all S&P 500 firms in every sector. In results not reported, I exclude financial and utility firms and obtain consistent results. Since only 18% of firms engage in NI hedging, my hedger sample for the level decision test is relatively small. With

such limitation, the results I show here may not hold if the sample if not comparable or the long-term trend of dollar is reversed.

6. CONCLUSION

The purpose of this study is to explore the source of value relevance of translation and how managers react to avoid negative responses from investors caused by unfavorable exchange rate movements. I decompose the translation into long-term and temporary portions by computing a five-year moving average to identify the long-term portion with the remainder considered transitory. I show that investors distinguish the long-term versus temporary portions of translation and impound only the long-term component in their valuation. Returns reflect the impact of the long-term portion of translation specifically long-term translation losses but have limited association with the remaining transitory portion. The finding suggests that contrary to some managers' concerns, investors are not confused by transitory translation but properly impound the value relevant information.

I then show that management is aware of the different impacts of the long-term and temporary portions of translation and take action by adjusting hedging practice accordingly. Firm NI hedging activities are significantly associated with long-term portion of translation. The transitory portion has no impact on either hedging participation decision (whether to hedge or not) or level decision (how much to hedge). I demonstrate that managers increase the use of NI hedging when facing long-term translation loss. This suggests that managers make their hedging decision based on an awareness that investors impound only long-term translation losses.

Table 3.1 Summary Statistics

Panel A: Sample used for examining the value relevance of OCI reporting

	N	Mean	min	p25	Median	p75	max
Ret	5206	.2	-.7	-.1	.1	.3	3.2
NI	5206	328.2	-471.1	-5.1	34.3	172.8	7098.0
OCI	5206	-17.5	-833.0	-9.9	-.3	2.5	520.0
Tran	5206	-24.5	-667.0	-9.1	-.3	.8	239.0
OCInotran	5206	10.9	-298.0	-.4	0.0	1.5	525.0
TranTemp	5206	-.7	-448.0	-4.0	-.0	2.5	408.2
TranLong	5206	-23.8	-398.2	-8.7	-1.0	-.0	20.2
TranLongGain	5206	5.00	0.0	0.1	0.4	2.5	20.2
TranLongLoss	5206	-33.6	-398.2	-15.2	-2.8	-.4	-0.0
Growth	5206	.1	-.6	-.0	.1	.1	1.6
Tasset	5206	6.9	.3	5.7	7.1	8.1	12.8

Panel B: Sample used for examining the decision on NI hedging participation

	N	Mean	min	p25	Median	p75	max
NIHedge	1722	.202	0	0	0	0	1
TranTemp	1722	.004	-.531	-.030	-.002	.019	.582
TranTempGain	1722	.013	0	0	0	0.18	.582
TranTempLoss	1722	-.020	-.531	-.026	-.002	0	0
TranLong	1722	-.042	-.511	-.036	-.017	-.004	.036
TranLongGain	1722	.002	0	0	0	0	.036
TranLongLoss	1722	-.043	-.511	-.036	-.017	-.004	0
DollarVol	1722	.975	.367	.461	.644	1.482	2.288
DispersFX	1722	.613	.039	.348	.55	.839	1.888
FXRatio	1722	.374	.020	.204	.369	.501	0.850
EM	1722	.021	0	0	.024	.036	.119
Tasset	1722	9.414	6.825	8.62	9.278	10.089	12.906
Leverage	1722	.252	.000	.146	.232	.332	.763
ROA	1722	.07	-.177	.040	.070	.110	.349
OtherHedge	1722	.767	0	1	1	1	1

Panel C: Sample used for examining the decision on NI hedging level

	N	Mean	Min	p25	Median	p75	Max
NIDegree	313	.168	.002	.033	.111	.234	.85
TranTemp	313	-.007	-.186	-.024	-.001	.017	.266
TranLong	313	-.018	-.108	-.027	-.016	-.006	.025
TranLongGain	313	.001	0	0	0	0	.025
TranLongLoss	313	-.019	-.108	-.027	-.016	-.006	0
DollarVol	313	1.06	.372	.538	1.136	1.741	2.288
DispersFX	313	.721	.213	.386	.666	.908	1.615
EM	313	.017	0	0	0	.034	.119
Tasset	313	9.896	7.296	8.823	9.765	10.721	12.579
Leverage	313	.265	.000	.178	.244	.321	.766
ROA	313	.095	-.116	.055	.082	.129	.293

Notes: Table 3.1 presents summary statistics for the sample. Panel A summaries the sample used for examining the value relevance of OCI reporting, covering Compustat firms with fiscal year ending from 2013 to 2019 representing 1366 firms with return data. Panel B summaries the sample used for examining the NI hedging decisions, covering S&P 500 firms with fiscal years ending from 2013 to 2019 representing 303 firms with translation exposure and available data for all control variables. Panel C consists of S&P 500 firms with fiscal years ending from 2013 to 2019 with translation exposure and engaging in NI hedging. In Panel B and Panel C, variables derived from translation, including *TranTemp, TranLong, TranLongGain* and *TranLongLoss*, are scaled by foreign assets.

Table 3.2 Pearson Correlation Coefficients

Panel A Sample used for examining the value relevance of OCI reporting

	Ret	*NI*	*OCI*	*Tran*	*OCInotran*	*TranTemp*	*TranLong*	*Growth*	*Tasset*
Ret	1								
NI	0.015	1							
OCI	0.0939***	0.0726***	1						
Tran	0.1110***	0.0156	0.758***	1					
OCInotran	0.0125	0.0831***	0.591***	0.0121	1				
TranTemp	0.0845***	0.0124	0.632***	0.838***	0.0178	1			
TranLong	0.0778***	0.0860***	0.343***	0.433***	0.0108	-0.0102	1		
Growth	0.0586***	0.0776***	0.0611***	0.0801***	0.0061	0.0433**	0.116***	1	
Tasset	-0.0726***	0.345***	0.0189	-0.0107	0.0443**	0.0183	-0.021	-0.0121	1

Notes: *NI*, *OCI*, and variables derived from translation are scaled by the market value of common shares outstanding at 8 months before the fiscal year-end.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Panel B Sample used for examining the NI hedging practice

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) NIHedge	1												
(2) NIDegree	0.649***	1											
(3) TranTemp	-0.00605	-0.00780	1										
(4) TranLong	0.0839**	0.0474	0.0151	1									
(5) TranLongGain	-0.0313	0.00880	0.106***	0.129***	1								
(6) TranLongLoss	0.0871***	0.0471	0.00648	0.997***	0.0473	1							
(7) DollarVol	0.0658*	0.0619*	-0.120***	-0.0242	-0.0888***	-0.0170	1						
(8) DispersFX	0.153***	0.0870***	0.00138	0.0924***	-0.0779**	0.0995***	-0.0384	1					
(9) EM	-0.0867***	-0.0357	0.0186	0.0180	-0.00654	0.0187	-0.0344	-0.0338	1				
(10) Tasset	0.208***	0.0976***	-0.00711	0.0571*	0.0100	0.0567*	0.0524*	0.0995***	-0.0532*	1			
(11) Leverage	0.0371	0.0389	-0.00830	-0.0244	0.00846	-0.0253	0.140***	-0.0438	-0.0535*	-0.0000703	1		
(12) ROA	0.119***	0.0949***	-0.000119	0.00724	-0.00735	0.00789	-0.0489	-0.0142	0.0150	-0.0182	-0.244***	1	
(13) OtherHedge	0.210***	0.139***	0.00179	0.0927***	0.0158	0.0920***	-0.00345	0.154***	-0.0162	0.146***	0.132***	0.0183	1

Notes: Variables derived from translation are scaled by the foreign assets. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3.3 Impact of the Reporting Transparency on Investor Returns

$$RET_{i,t} = a + \beta_1 NI_{i,t} + \beta_2 Loss_{i,t}*NI_{i,t} + \beta_3 TranTemp_{i,t} + \beta_4 TranLong_{i,t} + \beta_5 OCInotran_{i,t} + \beta_6 Growth_{i,t} + \beta_7 Tasset_{i,t} + \varepsilon_{i,t} \quad (1)$$

	(1)	(2)	(3)	(4)
NI	-0.016	-0.004	0.012	-0.049
	(0.246)	(0.247)	(0.244)	(0.247)
*Loss*NI*	0.107	0.099	0.072	0.153
	(0.278)	(0.278)	(0.276)	(0.283)
OCI	0.685**			
	(0.349)			
Tran		1.174**		
		(0.532)		
TranTemp			0.831	
			(0.624)	
TranLong			2.292**	
			(1.102)	
TranLongGain				-1.321
				(1.261)
TranLongLoss				2.092***
				(0.933)
OCInotran		-0.008	-0.012	-0.029
		(0.594)	(0.593)	(0.593)
Growth	0.163***	0.161***	0.158***	0.157***
	(0.048)	(0.048)	(0.049)	(0.049)
Tasset	-0.017***	-0.017***	-0.017***	-0.016***
	(0.005)	(0.005)	(0.005)	(0.005)
Industry & Year FE	Y	Y	Y	Y
Observations	5206	5206	5206	5206
R^2	0.070	0.071	0.071	0.074

Notes: Table 3.3 reports the results of Equation (1), which examines the impact of OCI items on investor returns for the full sample. The dependent variable, *RET*, is the buy-and-hold raw return for the window 8 months before to 4 months after the fiscal year-end. OCI and its components, including *Tran*, *OCInotran*, *TranTemp*, *TranLong*, *TranLongGain* and *TranLongLoss*, are scaled by the market value 8 months before fiscal year-end. All other variables are descripted in Appendix 3. Standard errors (clustered at the firm level) are reported in parentheses. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 3.4 NI hedging Decision – Likelihood of Hedging

$$NIHedge_{i,t} = a + \beta_1 TranTemp_{i,t} + \beta_2 TranLong_{i,t} + \beta_3 DollarVol_{i,t} + \beta_4 Exposure_{i,t} + \beta_5 EM_{i,t} + \beta_6 Tasset_{i,t} + \beta_7 Leverage_{i,t} + \beta_8 ROA_{i,t} + \beta_9 OtherHedge_{i,t} + \varepsilon_{i,t} \quad (2)$$

	(1)	(2)	(3)
TranTemp	-0.307*	-0.290*	
	(0.173)	(0.170)	
TranTempGain			-1.728*
			(1.928)
TranTempLoss			0.982
			(0.699)
TranLong	-3.320***	-3.031***	
	(1.099)	(10.100)	
TranLongGain			-2.362
			(9.472)
TranLongLoss			-2.653***
			(1.535)
DollarVol	0.201***	0.197***	0.189***
	(0.062)	(0.063)	(0.065)
DispersFX	0.581**		0.533**
	(0.255)		(0.257)
FXRatio		0.894**	
		(0.429)	
EM	-5.190	-5.491	-5.279
	(3.342)	(3.383)	(3.350)
Tasset	0.256***	0.252***	0.250***
	(0.081)	(0.080)	(0.081)
Leverage	0.652	0.604	0.642
	(0.577)	(0.577)	(0.575)
ROA	5.791***	5.319***	5.681***
	(1.417)	(1.364)	(1.411)
OtherHedge	0.786***	0.747**	0.792***
	(0.296)	(0.301)	(0.297)
Observations	1722	1722	1722
R^2	0.166	0.163	0.170

Notes: Table 3.4 reports the results of model (2), which examines the determinants of firms' probability of engaging in NI hedging. Dependent variable, *NIHedge*, is a dummy variable that takes the value of 1 if the firm engages in NI hedge in the period, and 0 otherwise. Variables derived from translation, including *TranTemp*, *TranLong*, *TranLongGain* and *TranLongLoss*, are scaled by foreign assets. Other variables are described in Appendix 3. NI hedging subsample consists of S&P 500 firms that are exposed to translation risk, with evidence of reporting translation. Standard errors (clustered at the firm level) are reported in parentheses.
$^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 3.5 NI hedging Decision – Level of Hedging

$$NIDegree_{i,t} = a + \beta_1 TranTemp_{i,t} + \beta_2 TranLong_{i,t} + \beta_3 DollarVol_{i,t} + \beta_4 Exposure_{i,t} + \beta_5 EM_{i,t} + \beta_6 Tasset_{i,t} + \beta_7 Leverage_{i,t} + \beta_8 ROA_{i,t} + \beta_9 Invmills_{i,t} + \varepsilon_{i,t} \quad (3)$$

	(1)	(2)
TranTemp	-0.185	0.064
	(0.243)	(0.173)
TranLong	-1.348**	
	(0.508)	
TranLongGain		6.675
		(4.317)
TranLongLoss		-2.531***
		(0.877)
DollarVol	-0.003	-0.002
	(0.035)	(0.032)
DispersFX	0.124**	0.108*
	(0.053)	(0.055)
EM	-0.839	-0.317
	(0.889)	(0.721)
Tasset	0.004	-0.013
	(0.028)	(0.023)
Leverage	-0.005	-0.081
	(0.251)	(0.252)
ROA	0.763	0.397
	(0.594)	(0.415)
Invmills	0.193	0.085
	(0.124)	(0.056)
Industry/Year	Y	Y
Observations	313	313
R^2	0.433	0.461

Notes: Table 3.5 reports the results of equation (3), which examines the determinants of firms' hedging level when they engage in NI hedging. Dependent variable, *NIDegree*, represents the level of NI hedging, computed as the total notional value divided by *FXAsset*. *Invmills* is the inverse mills ratio obtained from equation (2) to control for the potential sample-selection bias of the Hedger sample. Variables derived from translation, including *TranTemp*, *TranLong*, *TranLongGain* and *TranLongLoss*, are scaled by foreign assets. Other variables are described in Appendix 3. Only firms that are exposed to translation risk, with evidence of reporting translation, and engage in NI hedging are included. Industry and year fixed effects are included. Standard errors (clustered at the firm level) are reported in parentheses. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Appendix 3: Variable Construction

Name	Construction and Data Source
Dependent Variables	
Ret	Buy-and-hold raw return for the window eight months before to four months after the fiscal year-end of firm. (CRSP)
NIHedge	Dummy variable equals 1 if the firm engages in NI hedging, 0 otherwise (Hand collected from 10-K footnotes)
NIDegree	Total notional value of FX contracts designated as NI hedges, in US dollar (Hand collected from footnotes) scaled by foreign gross profit. Foreign gross profit is computed as: GP ratio × foreign sales (Hand collected from 10-K footnotes, and Compustat: GP)
Independent Variables	
OCI	Total other comprehensive income (Compustat: CI-NI)
Tran	Current year translation adjustments (Compustat: CICURR)
OCInotran	OCI excludes translation adjustment
TranLong	The moving average of translation adjustment over previous 5 years including the current year
TranTemp	The difference between *Tran* and *TranLong*
Control Variables	
NI	Net income scaled by the market value of the firm eight months before the fiscal year end (Compustat)
Loss	Dummy variable equals 1 if the firm reports a net loss in the given year and 0 otherwise (Compustat)
Tassets	Log of firm total assets (Compustat)
FXRatio	The ratio of the foreign assets over total assets
DispersFX	Geographic dispersion calculated as ΣAiln(1/Ai), where Ai is the ratio of subsidiary i's assets to the firm's total assets (Compustat Segments)
DollarVol	the standard deviation of dollar index over previous five years
EM	High earnings smoothing, equal to the firm's 3-year average of absolute value of abnormal discretional accruals if above the median, and zero otherwise. Abnormal discretional accrual is calculated as the modified Jones-model discretionary accrual controlling for profit. (Compustat)
Leverage	Financial leverage, calculated as: Total debt /AT (Compustat)
ROA	Firm profitability, calculated as: NI / AT (Compustat)
OtherHedge	Dummy variable equals 1 if a firm engages in any other type(s) of hedges, commodity hedging, interest rate hedging, or other type of currency hedging, and zero otherwise (Hand collected from 10-K footnotes)

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