Fair Value Opinion Shopping or Unbiased Reporting?

Abstract: Insurers frequently change the pricing sources of their fixed income securities. We study the causes and consequences of the pricing switch. We hypothesize that pricing switch could be driven by both managerial opportunism to inflate fair value estimate (i.e., FV opinion shopping) and/or effort to more faithfully report asset values (i.e., unbiased reporting). We categorize pricing switch as upward switch — where the firm switches to a new source that prices the security at a higher level than the current pricing source does, and downward switch — where the opposite occurs. We find that upward switch can be explained by both unbiased reporting and FV opinion shopping, whereas downward switch is mostly driven by unbiased reporting. Further, the manager is less likely to correct a prior upward bias than a prior downward bias. Pricing switch exhibits a pattern more consistent with FV opinion shopping when it is engaged by insurers with strong concerns for regulatory capital and for securities with high probability of other-than-temporary impairments (OTTI). Next, we examine the consequences of pricing switch from three perspectives. First, an upward switch results in greater magnitude of adjustment to fair value estimate and a more biased fair vale estimate than a downward switch does. The increase in FV estimate bias following an upward switch is mitigated by the presence of Big 4 auditors and external asset managers, but is exacerbated for insurers with strong regulatory capital constraints and securities with high probability of OTTI. Second, an upward switch effectively reduces both the likelihood and the magnitude of OTTI recognition, especially for securities with high probability of impairment. Third, the auditor charges higher audit fees for upwardly switched securities. Such increase in audit fees further depends on whether the pricing switch seems justified. Additionally, the credit rating agency assigns greater credit risks on upwardly switched securities. In sum, we provide evidence that insurers strategically change the pricing source of fixed income securities in order to achieve certain reporting objectives, and that there are certain costs associated with FV opinion shopping.

Keywords: Fair value opinion shopping, fair value estimation, fair value inflation, insurance companies, pricing sources, managerial opportunism, faithful representation

1. Introduction

Statement of Financial Accounting Standard No. 157 (ASC 820) (Statements of Statutory Accounting Principles 100R) requires firms (insurers) to use the three-level hierarchy to disclose the nature of inputs used in their fair value (FV) estimates of assets. Level 1 estimates rely on quoted prices from an active market for identical assets, level 2 estimates rely on verifiable market input but with adjustment, and level 3 estimates rest upon unobservable inputs. Prior research generally concludes that market participants perceive higher reliability for fair value estimates derived from external third-party pricing sources compared to those from less verifiable inputs which are more subject to managerial discretion and fair value inflation (Goh et al. 2015; Song et al. 2010; Ettredge et al. 2014; Ayres 2016). However, little is known on whether the valuation of securities based on external third-party sources is immune from managerial opportunism. This question is important since fair value estimates of the vast majority of investment securities rely on external third party sources.[1] We fill this void in the literature.

The market inputs provide a reliable fair value estimate for assets traded in thick markets (Kaplan 2011). However, when securities are traded in relatively thin markets, there is a greater divergence in fair value estimates. Such divergence affords managers with greater discretion over the source of market inputs to use. We study the causes and consequences of insurers' decision to switch the external third-party sources used to value their fixed income securities using Life insurers' statutory filings with the National Association of Insurance Commissioners (NAIC). NAIC requires insurers to disclose the fair value, par value, hierarchy level, and estimation source

[1] Based on insurer disclosure during 2012-2014 in compliance with NAIC regulation, Hanley et al. (2018) report that the fair value estimates of approximately 5.6% and 94.4% of fixed income securities are based on self-estimation and third-party pricing sources, respectively, whereas fixed income securities account for 72% of investment securities held by insurers. Our data shows that 7% and 93% of fixed income securities are based on self-estimation and third party source, respectively.

of each security every year. Such disclosure allows a rare opportunity to observe the occurrence and consequences of the switch of external pricing sources.

We focus on Life insurers for several reasons. First, insurers hold majority of their investment as fixed income securities reported at amortized costs subject to impairment. Compared with Property and Casualty (PC) Insurers, Life insurers carry more of their fixed income securities at amortized cost.[2] Second, PC insurers carry only investment grade securities (SVO designations 1-2) at amortized cost; in contrast, Life insurers further carry at amortized cost securities that are below investment grade (SVO designations 3-5) and thus are exposed to higher impairment risk. Third, insurers have strong incentives to comply with the regulatory capital requirements (Petroni 1992; Hanley et al. 2018). Other-than-temporary impairment (OTTI) recognition reduces the regulatory based capital (RBC) ratio for Life insurers, but not for PC insurers (Khan et al. 2019).[3] Thus, Life insurers have stronger capital-based incentives to delay or avoid OTTI impairments. Fourth, due to their greater need to measure certain securities at fair values, PC insurers make greater investment in information and control systems, leading to more timely OTTI recognition than Life insurers (Khan et al. 2019). More reliance on historical cost accounting by Life insurers may induce weaker control and more latitude in the timing of OTTI recognition. In sum, due to the differences in security holdings, strength in information and control system, and regulatory

[2] Specifically, NAIC's Securities Valuation Office (SVO) assigns securities to designations 1-6, with higher designation representing lower credit quality. SSAP No. 43R requires that Life insurers carry securities with SVO designations of 1-5 (6) at amortized costs (fair value). In contrast, PC insurers carry securities with SVO designation of 1-2 (3-6) at amortized costs (fair value) (Khan et al. 2019). Based on Hanley et al. (2018), on average, 93% and 100% of securities are carried at amortized cost by PC insurers and Life insurers, respectively.

[3] For Life insurers, OTTI recognition reduces the total adjusted capital, the numerator of RBC ratio, by reducing either asset valuation reserve (AVR) or unassigned surplus. For PC insurers, since the unrealized fair value losses of securities with SVO designations 3-6 are already incorporated as a reduction of total-adjusted capital (the numerator of regulatory capital ratio), additional OTTI recognition will not affect the regulatory capital ratio (Khan et al. 2019).

capital-based incentives between the two types of insurers, we expect that Life insurers have stronger incentives to avoid or delay the OTTI recognition than PC insurers do.

We measure manager bias in fair value estimate with FV difference, which is the difference between the fair value estimate for a security by an insurer and the mode fair value estimate across all insurers for the same security at the same point in time (Hanley et al. 2018).[4] A positive (negative) FV difference with a greater absolute value indicates a greater inflation (deeper discount) of the fair value estimate relative to the mode value. We refer to securities with positive, negative, and zero FV difference as inflated, discounted, and on-target securities, respectively.

Based on a sample of 631,928 fixed income security-insurer-year observations by 655 unique insurers during 2014-2017,[5] we find that on average the pricing sources are switched for 12.4% of securities by 70% of insurers. We categorize pricing switch as upward switch — where the firm switches the pricing source and experiences an increase in FV difference, and downward switch— where the opposite occurs. We hypothesize that pricing switch could be driven by both FV opinion shopping and unbiased reporting. Under FV opinion shopping, firms switch the pricing source in order to estimate the security at a more favorable value.[6] Under this incentive, a pricing switch will occur if it generates some benefits, such as enabling the firm to achieve a certain

[4] Based on a subsample of corporate bonds with available prices, Hanley et al. (2018) report that the mode fair value estimate is not significantly different from the year-end selling price of institutional-sized trades.

[5] We focus on fixed income securities for several reasons. First, bonds comprise the largest percentage (72%) of investment portfolios of insurers (Hanley et al. 2018). According to Capital Markets Bureau (2011), in 2010, bonds held by Life (PC) insurers accounted for 69% (26%) of bonds in the insurance industry. Moreover, Life (PC) insurers held 74% (60%) of investments in bonds. Second, the impairment risk is most salient for bonds, with bond OTTI comprising the largest portion (52%) of total OTTI of the insurance industry in 2015 (NAIC Capital Markets Bureau 2017). Third, unlike stocks, fixed income securities are thinly traded in over-the-counter market (Hanley et al. 2018), where price can be divergent among different pricing vendors. Such setting allows insurers to actively engage in pricing switch.

[6] Salzsieder (2016) defines fair value opinion shopping as “the practice of seeking a valuation opinion to support any primary objective other than faithfully representing the asset (or liability) being valued”.

regulatory-based capital (RBC) ratio (Bennett 2014),[7] delaying OTTI recognition (Hanley et al. 2018), or justifying higher compensation to investment managers whose pay is linked to total asset-under-management or holding period returns. Under unbiased reporting, firms may switch the pricing source in order to more faithfully estimate asset fair values. Under this incentive, we expect that a pricing switch will occur if the new valuation source offers a value that is more in line with the market consensus, irrespective of whether it is accompanied by any benefits to the insurer. The two incentives are not mutually exclusive and could co-exist as the driving force for pricing switch.

We first explore the determinants of pricing switch. If unbiased reporting dominates, an insurer should engage in an upward (a downward) switch for securities with a discounted (inflated) FV estimate in the previous year. If FV opinion shopping prevails, the pricing switch will not exhibit this pattern. We find that an upward switch could be explained by both incentives, and that a downward switch is mostly explained by unbiased reporting. Further, the manager is less likely to correct a prior upward bias than a prior downward bias in FV estimate, and is more likely to exacerbate a prior upward bias than a prior downward bias. Such asymmetric behavior is more consistent with FV opinion shopping than with unbiased reporting. Prior research document stronger incentive to understate claim loss reserves by financially weak insurers (Petroni 1992) and incentives to avoid the OTTI recognition by insurers because it negatively impacts RBC ratio (Hanley et al. 2018; Khan et al. 2019). We define a security as having high-impairment-risk if its FV estimate by the insurer is below the adjusted carrying book value. We find evidence more consistent with FV opinion shopping when the pricing switch is engaged by financially weak insurers with low RBC ratio and for securities with high impairment risk.

[7] RBC ratio is calculated as the ratio of statutory capital (i.e., total adjusted capital) to required capital (i.e., authorized control level risk-based capital). The numerator equals the sum of asset valuation reserve, unassigned surplus, and 0.5 times the dividend liabilities. The denominator is based on a formula that incorporates risk factors, such as asset risk, insurance risk, interest risk, and business risk.

We next examine the consequences of pricing switch on the quality of FV estimate. On average, compared to a downward switch to correct prior upward bias, an upward switch to correct prior downward bias has significantly greater magnitude and leads to more biased FV estimate. Further, the greater bias associated with an upward switch is mitigated by the presence of Big 4 auditors and the use of external financial managers, but is exacerbated for financially weak insurers with low RBC ratio and for securities with high impairment risk. We further explore whether an upward switch affects the likelihood and magnitude of OTTI recognition during the current and subsequent period.[8] We find that an upward switch effectively reduces the likelihood and the magnitude of the OTTI recognition, such negative impact is even stronger for high-impairment-risk securities. However, a downward switch does not impact, and even reduces, the likelihood and magnitude of OTTI recognition.

Finally, we examine whether outside monitors, specifically the auditor and the credit rating agency, evaluate the risk of FV opinion shopping. We find that the auditor charges higher audit fees to clients with higher proportion of securities with an upward switch during the current year. Further, such fee increase only applies to upwardly switched securities already with inflated or on-target fair value estimate in the previous year. These findings suggest that the auditor responds to the risk associated with an upward pricing switch, and that such response further depends on whether the upward switch is justified. Last, we find weak evidence that the credit rating agency assigns higher credit risk on insurers with greater magnitude of upwardly switched securities, but

[8] On one hand, if the switch decision is driven by unbiased reporting, it should be made independent of its potential impact on the OTTI recognition. Then, an upward (a downward) switch should mechanically reduce (increase) the likelihood and the magnitude of the OTTI recognition. On the other hand, if the downward switch is strategic and occurs only for securities with low impairment risk, then a downward switch will not affect, or even reduces, the likelihood and magnitude of the OTTI charge.

we find strong evidence that rating agencies significantly discount the valuation of securities with a pricing switch relative to securities without a pricing switch in assigning credit rating.

We make the following contributions to the literature. First, prior fair value literature generally suggests that the valuation of financial assets relying on observable external market inputs are highly verifiable and harder to manipulate than that of financial assets relying on manager self-estimation (Song et al. 2010; Ettredge et al. 2014; Altamuro and Zhang 2013; Magnan et al. 2015; Hanley et al. 2018). Our evidence shows that this conclusion might be more valid for securities traded in active markets with little divergence in market opinions. However, for securities traded in less active markets where market opinions diverge, the disciplining role of the external third-parties over manager is weakened. The manager may strategically choose those market inputs more aligned with his reporting objectives rather than market inputs that more faithfully reflect the underlying value of the security. Our findings suggest the existence of FV opinion shopping for fixed income securities by insurers. Additionally, the motivation to comply with regulatory capital and to delay the OTTI recognition could be important drivers for FV opinion shopping. Our finding implies that even for financial assets whose values are entirely derived from third-party market inputs, their valuations are not entirely immune from managerial opportunism.

Second, prior research suggests that firms delay the impairment recognition of assets such as goodwill by exploiting discretion due to the non-verifiability of the fair value of goodwill (Ramanna and Watts 2012). Since the tests are carried at firm level rather than asset level, it suffers from measurement error in both identifying firms whose goodwill is actually impaired and in the actual impairment charge recognized by firms (Hodder, Hopkins, and Schipper 2014).[9] Due to the lack of data, there is little direct evidence on how the manager strategically uses the discretion embedded in fair value estimate to avoid impairment recognition. We offer security-level evidence suggest that managers engage in FV opinion shopping to avoid or delay the impairment recognition.

Third, prior research finds that the audit fee increases and credit risk elevates as the verifiability of the valuation of fair-valued assets decreases (Ettredge et al. 2014; Ayres 2016). We find that even within assets whose fair values are entirely verifiable with third-parties, the auditor and the rating agency respond to potential managerial opportunism with pricing switch. This finding implies that external monitors could impose potential costs on FV opinion shopping.

Two studies closely related to our study are Hanley et al. (2018) and Salzsieder (2016). Hanley et al. (2018) documents that insurers strategically designate security input level and that self-estimation is the primary driver of FV inflation. In contrast, we focus on a different dimension of manager discretion—the strategic use of third-party valuation sources, which is commonly perceived as more reliable than self-estimation. Additionally, we also provide evidence on potential costs associated with manager discretionary behavior due to monitoring from the external auditor and credit agencies. In his experiment, Salzsieder (2016) studies whether and how the requirement to disclose managers' FV opinion shopping deters such behavior. He finds that managers are likely to shop for FV opinions if they are not required to disclose shopping behavior to the board or auditors. In contrast, we study FV opinion shopping in a regime that mandates the disclosure of such behavior.

[9] Specifically, Ramanna and Watts (2012) use greater-than-one book-to-market ratio to identify firms with goodwill impairment. However, "compared to the fair-value-based recoverability test required for goodwill impairment evaluation, the recoverability test for non-goodwill noncurrent assets is biased toward non-recognition of material economic impairments" and "there is a higher likelihood that a persistent BTM>1 reflecting an economic impairment that is not recognized for accounting purpose is related to a non-goodwill asset group." In addition, due to coding errors, the goodwill impairment recognition in Compustat is not always accurate or complete (Hodder, Hopkins, and Schipper 2014, 244).

Our paper is subject to several potential limitations. First, our study is limited to the insurance industry. Thus, one should be cautious at generalizing our findings to other industries. Second, although the incentives to avoid or delay OTTI recognition could drive FV opinion shopping, we cannot preclude other causes for FV opinion shopping. Third, each state has its own regulations and examination procedures that may cause differential impact on insurer's valuation practice. However, NAIC endeavors to provide a consistent guidance in the NAIC Accounting Practices & Procedures Manual and SVO Procedures Manual for valuation issues.

The rest of the paper proceeds as follow. Section 2 presents the institutional background and hypothesis development. Section 3 describes the data, estimation models and descriptive statistics. Section 4 reports the empirical results. Section 5 concludes.

2. Institutional Background and Hypothesis Development

2.1. Institutional Background on Pricing Switch

The fixed income security market is characterized by infrequent trade and multiple pricing services. In many cases, pricing services offer different quotes for the same security at the same point of time. The opinion divergence arises because the vast majority of debt securities are not traded on a daily basis (Edwards et al. 2007; May 2010; Hollifield et al. 2017),[10] but instead are transacted over-the-counter (May 2010), leading to greater information asymmetry and the lack of price transparency.[11]

[10] Edwards et al. (2007) report that the median trade of corporate bonds is less than one per day. May (2010) documents that 50% of the observations in his sample trade on fewer than fourteen days during the 101 market days centered on the rating change date. About 16% of securities in his observations do not rate at all and only 1.5% trade every day during his sample period.

[11] In 2005, NYSE reported that only 534 corporate bonds were listed on the NYSE, that average daily transactions of all listed bonds amounted to only 128, and that average par volume per trade was $29,600 (NYSE 2007; May 2010). By comparison, TRACE reported that the total number of average daily transactions of corporate bonds (both convertible and non-convertible) amount to 53,276 and the average daily par value amount to approximately $22,879 million for December 2017 (TRACE 2018).

FASB (Financial Accounting Standards Board) allows pricing services to use mid-market price or the average between ask and bid price to price fixed income securities (FASB 2011; KPMG 2017). But if the mid-market price does not fairly represent the true price, pricing sources can choose other values as long as they fall within the bid-ask spread. For example, the pricing sources could consolidate and average price quotes from security brokers, use the latest quote, or use the best ask/bid price.

Statements of Statutory Accounting Principles (SSAP) 100 adopts ASC 820 on fair value measurements, with modification, by additionally requiring insurers to disclose fair value hierarchy as well as the method used to obtain fair value at the security level. Insurers can select any of the five price sources: pricing service, stock exchange, broker or the insurer's custodian, NAIC Valuation of Securities database, or self-estimation.[12] Although SSAP 100 follows ASC 820 in that if the price input is observable, the fair value should be based on the market data independent of the reporting entity, SSAP 100 is silent on the general criteria for selection from different sources. Thus, insurers have discretion to choose the pricing sources, which vary considerably across insurers.[13]

Since the quote for the same security could vary across different pricing sources, firms do not have to rely on just one single source. Instead, they compare quotes among different pricing services and/or perform an internal analysis. Based on Deloitte Fair Valuation Pricing Survey which aggregates the views of 89 mutual fund firms, more than 50% of survey participants visit all pricing sources for the security annually, 22% (34%), 16% (30%), 16% (24%), and 20% (47%)

[12] This regulation is applicable to all our sample periods between 2014 and 2017.

[13] In the general interrogatories section of annual statutory filings, insurers disclose their own pricing sources for fixed income securities. Some insurers disclose that they assign equal importance to multiple pricing sources that they use, while others assign different weights on their pricing sources. The latter type of insurers would have primary, secondary, and tertiary pricing sources. In terms of the method to obtain prices, some insurers independently obtain and download price information from pricing service websites, while others obtain from their custodians, brokers, external investment managers or, in rarer cases, rating agencies.

of fund managers change their primary (secondary) pricing sources during 2014, 2015, 2016, and 2017, respectively, indicating that it is a common practice to change third-party pricing sources during our sample period (Deloitte 2017).

2.2. The Determinants of Pricing Switch

2.2.1. The Direction of Previous Fair Value Estimate Bias

Firms may switch the valuation source for certain securities because the new valuation source provides a more representative measure of the fair value. We label this incentive as unbiased reporting.[14] This incentive is credible because a significant misrepresentation of the asset value can result in the adjustment in financial statements, non-admission of investment which negatively impacts RBC ratio, and even an order of rehabilitation or liquidation.[15] When the manager corrects a previously less accurate fair value estimate by switching to a new pricing source, we expect that the fair value estimate should move closer to the mode value after the switch than before the switch, leading to a higher-quality fair value estimate.

However, firms can also exploit the discretion with the estimation source to achieve a desired regulatory and/or financial reporting outcome (Salzsieder 2016). We label this incentive as fair value (FV) opinion shopping. Reporting greater investment assets could help insurers in several ways. First, when insurers do not expect to receive the cash flows according to the contractual terms of a fixed income security in effect at the date of acquisition, they should

[14] For example, some insurers stated in their reports that management selects a sample on a monthly basis to perform a valuation analysis and decides whether the security is appropriately valued, and if not, they would determine which source can best represent the true value (e.g., Athene Life Insurance Company's 2015 Statutory Filing). Based on the Deloitte fair value survey, 53% survey participants noted that they would submit a price challenge when they have conflicting market data with their pricing services, and 75% of participants may change a price if they believe it is not accurate even if they have not received a response from the pricing service (Deloitte 2015).
[15] This statement is based on the voluntary responses from 10 out of 50 state regulators who replied to our email survey on whether and how they regulate securities with inflated fair value estimates. We sent the email survey during the period between February and June 2018. The states that responded include: Idaho, Illinois, Michigan, Maine, Missouri, New Mexico, Oregon, Washington, Wisconsin, and Wyoming.

recognize OTTI.[16] Insurers can delay the timing and/or reduce the amount of OTTI recognition by estimating higher fair value. Since OTTI recognition reduces RBC ratio, a delayed or reduced OTTI recognition through FV inflation could help achieve certain regulatory RBC ratio. Second, investment managers' compensation can be affected by FV estimates. For example, Houlihan Lokey (2016) finds that fund managers' compensation is normally tied to the total assets-under-management and the portfolio performance presumably based on the holding-period returns. Fund managers may be tempted to overvalue the assets in order to receive higher fees. Third, public insurers may have stronger incentives to upwardly bias fair value estimates. For financial reporting purpose, a large amount of fixed income securities are recognized as available-to-sale assets by public insurers according to ASC 320 (SFAS 115) (Ketz 1999; SEC 2008), and the same FV estimates are used for both regulatory and financial reporting purposes (Hanley et al. 2018).[17] The unrealized gains and losses recognized in other comprehensive income could be value relevant (Jones and Smith 2011).

Because we do not directly observe manager intention, we infer the economic determinants of pricing switch based on the direction of the switch in relation to the direction of previous FV estimate bias. Under unbiased reporting, the manager will try to correct previous FV estimate bias by converging the FV estimate towards the true value of the asset.[18] Specifically, relative to on-target securities, managers will be more (less) likely to engage in an upward switch for previously discounted (inflated) securities, and will be more (less) likely to engage in a downward switch for

---

[16] We discuss the specific institutional details of OTTI recognition by insurers in Section 2.2.3.
[17] Unlike ASC 320, SSAP 26R and 43R do not place fixed income securities into one of three following categories: trading, available-for-sale, or held-to-maturity securities.
[18] Following Hanley et al. (2018), we assume that the mode value of the security is a good approximation of its true value. Hanley et al. (2018) compare the mode FV estimates of securities to their year-end sell prices for institutional sized trades and find that the difference between the two is not statistically different from zero.

previously inflated (discounted) securities. Therefore, the pricing switch is more likely motivated by unbiased reporting if it is in the opposite direction of prior bias. In contrast, the pricing switch is more likely driven by FV opinion shopping if it does not exhibit such a pattern.[19] We test whether the direction of pricing switch depends on prior FV bias in the first hypothesis:

H1a: The likelihood of an upward switch is positively (negatively) associated with previous discount (inflation) in FV estimate, while the likelihood of a downward switch is positively (negatively) associated with previous inflation (discount) in FV estimate.

Under unbiased reporting, the manager's incentive to correct prior upward bias should be the same as the incentive to correct prior downward bias in FV estimate. However, under FV opinion shopping, the manager has stronger incentive to correct a prior downward bias than an upward bias, and may even avoid a downward switch when one is warranted. We test whether the tendency for the correction of prior bias is symmetric between upward and downward bias.

H1b (null): The likelihood of an upward switch for previously discounted securities is not different from the likelihood of a downward switch for previously inflated securities.

The manager may fail to correct prior bias for various reasons. For example, the manager may genuinely believe his prior FV estimate better reflects the true value of the security than the mode FV estimate does. In this case, the manager will at least not aggravate prior bias. Under unbiased reporting, the incentive to avoid aggravating prior bias should be the symmetric between prior and downward bias. However, under FV opinion shopping, the manager will have stronger incentives to exacerbate a prior upward bias than a prior downward bias. We next test whether the exacerbation of prior bias is symmetric between upward and downward bias:

H1c (null): The likelihood of an upward switch for previously inflated securities is not different from the likelihood of a downward switch for previously discounted securities.

---

[19] For example, the manager could engage an upward switch for securities already with an upward bias in its previous FV estimate. When the previous FV estimate was discounted, although the manager may also engage in FV opinion shopping through an upward switch, we cannot distinguish between the two explanations since both predict an upward switch. In addition, although a downward switch for securities with prior deflation naturally intensifies the downward bias, we believe such behavior more likely stems from accounting conservatism than FV opinion shopping.

2.2.2. Firm Performance

Prior research finds that financially weak insurers have stronger incentives to manipulate financial reports through understating claim loss reserve (Petroni 1992; Gaver and Paterson 2000), or to engage in self-estimation and have greater aggregated FV inflation (Hanley et al. 2018), in order to satisfy regulatory capital requirement and to avert regulatory intervention. Under unbiased reporting, firm performance should not moderate the relation between the direction of pricing switch and prior FV bias, since the pricing switch decision will be purely driven by previous fair value estimate bias, regardless of firm performance. However, under FV opinion shopping, firms with poorer performance will have greater pressure to obtain more favorable FV estimates in order to appear financially strong. Thus, financially weak insurers will be more (less) likely to engage an upward (downward) switch. We measure financial performance with RBC ratio (Hanley et al. 2018) and test the following hypothesis.

H1d (null): The association between the likelihood of an upward/a downward pricing switch and previous FV inflation/ discount is not moderated by RBC ratio.

2.2.3. Securities with High Probability of Impairment

Under SSAP 26R, insurers need to recognize impairment if it is probable that they will be unable to collect all amounts due according to the contractual terms of a debt security in effect at acquisition date or the time of recent OTTI.[20] OTTI recognition includes situations where an insurer has made a decision to sell a security prior to its maturity at an amount below its carrying value. If it is determined that a decline in fair value is other-than-temporary, OTTI will be recognized as the entire difference between the bond’s carrying value and its fair value.

[20] SSAP 26R governs bonds including treasuries, government agency securities, municipal securities, corporate bonds, while SSAP 43R governs loan-backed and structured securities such as mortgage-backed securities and asset-backed securities. In periods subsequent to the recognition of OTTI loss for a bond (SSAP 26R) or structured securities (SSAP 43R), the insurer should account for OTTI as if the security had been purchased on the measurement date of the OTTI.

Under SSAP 43R, insurers need to recognize OTTI for loan-backed securities, if they do not expect to receive the cash flows expected to be collected at acquisition date or the time of the most recent OTTI (Khan et al. 2019). If they do not intend to sell and have the intent and ability to hold the OTTI-impaired securities prior to the recovery of their amortized costs, the cost bases are written down to the present value of discounted cash flows expected to be collected,[21] otherwise they are written down to fair value (Khan et al. 2019)[22].

Once insurers decide to recognize OTTI, credit-related OTTI losses, i.e., the difference between the book/adjusted carrying value and the present value of cash flows expected to be collected, are recorded through a decrease in asset valuation reserve (AVR), which is a capital account set aside to absorb equity and credit losses.[23] If insurers are not required to maintain AVR, losses are recorded through unassigned surplus. Non-credit related OTTI losses,[24] i.e., change in prevailing interest rate leading to fair value falling below the present value of the cash flows expected to be collected, are recorded through interest maintenance reserve (IMR).[25] Decreases in

[21] According to SSAP 43R, for loan-backed and structured securities, insurers do not record non-credit-related OTTI losses, i.e., decreases of fair value below the present value of cash flows, on OTT impaired securities that they do not intend to sell and more likely than not will not have to sell the security prior to recovery of the securities' amortized cost bases (Khan et al. 2019).

[22] Credit-loss can occur due to security-specific factors such as increase in credit default risk, higher implied volatility of the security, or the failure of the issuer of the security to make scheduled principal or interest payments. Non-credit loss can occur due to systematic factors such as increase in prevailing market interest rate, less liquidity in the market, or higher sociopolitical risk.

[23] AVR is one component of total-adjusted capital, the numerator of RBC ratio. Total adjusted capital is the sum of unassigned surplus, AVR and 0.5 times the dividend liability.

[24] For securities defined by SSAP 26R and 43R with SVO designation of 6, credit-related OTTI losses (or non-interest-related losses) and non-credit-related OTTI losses (or interest-related losses) are recognized as unrealized losses, to the extent that these losses have not previously been recorded under the lower of cost or market accounting. Credit-related losses and non-credit-related losses of securities with SVO designation of 6 are also recognized as reductions in AVR and IMR, respectively.

[25] SSAP No. 7 governs AVRs and IMRs. IMR is calculated as the beginning balance + (-) the realized after-tax capital gains (losses) + (-) realized after-tax liability gains (losses). AVR is calculated as beginning balance + (-) the realized after-tax capital gains (losses) + (-) unrealized capital gains (losses) + (-) transfers between components, + an annual contribution, + any voluntary contribution + (-) an adjustment.

AVR or in unassigned surplus negatively impact total adjusted capital, the numerator for RBC ratio for Life insurers, but not for PC insurers (Khan et al. 2019).

Avoiding OTTI recognition is particularly crucial for Life insurers also because they hold most securities at the amortized costs. Under unbiased reporting, managers' incentive to correct prior estimation bias should be independent of whether the security has high probability of impairment. Under the FV opinion shopping, however, the manager has stronger incentive to engage in an upward switch, and to avoid a downward switch, for high-impairment-risk securities. Since financial examiners can request additional information to determine which individual securities have a book/adjusted carrying value significantly in excess of their fair value and whether an OTTI should be recognized (NAIC 2016), we expect that insurers will pay greater attention to securities with the FV estimate less than the book adjusted carrying value and greater exposure to OTTI. We test the following hypothesis.

H1e (null): The association between the likelihood of an upward/a downward pricing switch and previous fair value inflation/ discount is not moderated by whether the security has a high probability of other-than-temporary impairment.

2.3. The Effect of Pricing Switch on Fair Value Estimation Bias

The two incentives will result in different consequence of pricing switch on FV estimate. Under unbiased reporting, the pricing switch aims to move the FV estimate closer to the true value and reduce FV estimate bias. The quality of FV estimate should not be systematically different between after an upward switch and after a downward switch.[26] Under FV opinion shopping, however, the manager might have incentives to engage in greater magnitude of an upward switch than a downward switch; FV estimate will tend to be biased to a greater extent after an upward

[26] Even under the unbiased reporting incentive, FV estimate could still be different from the mode value of FV estimate after the pricing switch. It is because the mode value is a moving target that changes from year t-1 to t. If the manager cannot perfectly observe the FV estimate of all other insurers in year t, he may not observe the most recent mode value of the security.

switch than after a downward switch. Following Hanley et al. (2018), we measure FV estimate bias with FV difference and test this hypothesis.

H2a (Null): After the pricing switch, the extent of FV difference is not different between securities with an upward switch and securities with a downward switch.

We further examine the extent of correction of prior FV estimate bias through the pricing switch. Under unbiased reporting, the extent of correction should depend on the magnitude of prior bias. Specifically, if the magnitude of prior FV estimate bias is greater (less) for upward bias than for downward bias, we would expect a greater (less) magnitude for downward correction than for upward correction. Under FV opinion shopping, the manager might have incentives to engage a greater magnitude of upward correction than downward correction, regardless of the size of prior bias. Consequently, we test the following hypotheses.

H2b (Null): If the magnitude of prior FV estimate bias is greater (less) for upward bias than for downward bias, then the magnitude of downward correction will be greater (less) than the magnitude of upward correction .

2.4. The Effect of Pricing Switch on Future Impairment

A strong incentive behind FV opinion shopping could be to delay or minimize the OTTI recognition, rather than to overstate the valuation of all assets. Thus, whether pricing switch affects the timing and magnitude of future impairment charges provides evidence on potential benefits of FV opinion shopping.

Under unbiased reporting, the switch decision should be independent of its impact on an OTTI charge, we would expect a mechanical negative (positive) association between an upward (a downward) switch and the likelihood of an OTTI charge. However, under FV opinion shopping, the manager will be less likely to engage in a downward switch when doing so increases the likelihood of an OTTI charge, even if a downward switch is warranted. In this case, we would *not* observe a positive association, or even observe a negative association, between a downward switch and an OTTI charge. We test the above conjecture in the following hypothesis:

H3a: The likelihood of a subsequent OTTI recognition is negatively (positively) associated with the upward (downward) pricing switch.

The association between a pricing switch and impairment magnitude is not straightforward. An upward switch can reduce the magnitude of impairment because of the inflated FV estimate. Nonetheless, once the impairment has to be recognized, an upward switch may not help reduce the impairment magnitude recognized if FV estimate of the security has been inflated over a long period of time due to delayed OTTI recognition. A downward switch should increase the magnitude of impairment. However, the downward switch might be engaged only when it does not significantly increase the impairment magnitude. In the following hypotheses, whether the pricing switch affects the magnitude of OTTI recognition is an empirical question.

H3b (Null): The magnitude of a subsequent OTTI recognition is not associated with the upward and downward pricing switch decision.

Since high-impairment-risk securities (i.e., fair value less than adjusted carrying value in the prior period) are more likely to have an OTTI recognition, we further expect that an upward switch will even be more effective in reducing the likelihood of an impairment recognition for securities with high probability of impairment.

H3c: The negative association between the likelihood of an OTTI recognition and the upward pricing switch decision is greater for high-impairment-risk securities.

2.5. The Implications of Pricing Switch for Audit Pricing and Credit Rating

Although FV opinion shopping has potential benefits for insurers, it might also be associated with certain costs. An importance source of the cost is the disciplining role played by the external auditor and the credit rating agency.

SSAP 100R requires that insurers disclose the pricing sources and the prices used to value the investment securities. With access to such detailed security-level documentation, the auditor could inquire the existence and reasons for the pricing switch, evaluate potential incentives behind the switch, and unravel effects of the switch. Such scrutiny may help the auditor at least partially distinguish FV opinion shopping from unbiased reporting. As risk of FV opinion shopping heightens, the auditor could modify the nature, timing, and extent of the audit procedure and/or modify the audit opinion with explanatory paragraphs to highlight pricing switch with material effects. To compensate for the extra audit effort and higher risk, the auditor will charge higher fees for securities with a pricing switch potentially motivated by FV opinion shopping. However, prior research suggests that even professionals such as auditors encounter difficulties in detecting managerial opportunism in FV estimation (Joe et al. 2017). The PCAOB found instances where auditors have not gained an adequate understanding of the specific methodologies or assumptions underlying FV estimates that were obtained from external sources (Bratten et al. 2012; Houlihan Lokey 2016; Joe et al. 2017; Glover, Taylor, and Wu 2017). If the auditor cannot accurately distinguish between opportunistic and unbiased reporting, they may not respond to the pricing switch decision appropriately.

The credit rating agencies may also assign higher credit risk to upwardly switched securities. Prior studies find that information risk impacts the pricing of assets (Duffie and Lando, 2001; Easley and O'Hara 2004; Lambert et al. 2007). Ayres (2016) documents that greater holdings of level 3 assets negatively impact credit ratings, because they are harder to verify and carry higher information risk. In the same vein, we expect that an upward switch intending to inflate asset value increases information risk and that credit rating agencies will perceive higher credit risk for securities likely affected by FV opinion shopping.

Credit rating agencies may also ignore securities affected by FV opinion shopping, since the right of cash flows of a firm is a more pronounced concern for equity investors rather than creditors (Ayres 2016). In addition, incomplete accounting information reflects short-term credit risk rather than long-term (Duffie and Lando 2001; Ayres 2016), while credit ratings are viewed as a measure of long-term credit-risk (Ayres 2016). Furthermore, rating agencies may not be sophisticated enough to unravel opportunism. We present our last hypothesis in the null form.

H4 (Null): Total audit fees and credit ratings do not differ between securities with an upward switch and securities without a switch, and between securities with an upward switch and securities with a downward switch.

3. Sample and Research Design

3.1. Model Specification

To test the determinant of pricing switch, we estimate the following models at the security-insurer-year level:[27]

$$Upward\ Switch_{ijt} = \alpha_0 + \alpha_1 Inflation_{ijt-1} + \alpha_2 Discount_{ijt-1} + Controls + Fixed\ Effects + \varepsilon_{ijt} \quad (1a)$$

$$Downward\ Switch_{ijt} = \beta_0 + \beta_1 Inflation_{ijt-1} + \beta_2 Discount_{ijt-1} + Controls + Fixed\ Effects + \varepsilon_{ijt} \quad (1b)$$

where $Upward\ Switch_{i,j,t}$ ($Downward\ Switch_{i,j,t}$) equals one if security j experiences an upward (a downward) pricing switch from period t-1 to t at firm i, zero otherwise.

We include possible determinants of pricing switch measured during the year t-1. $Inflation_{i,j,t-1}$ ($Discount_{i,j,t-1}$) equals one if $FV\ Difference_{i,j,t-1}$, which is the difference between FV estimate for security j by firm i and its mode value across all insurers is greater than zero (less than zero), zero otherwise. We control for four additional security-level characteristics. $Spread_{j,t-1}$ is the

[27] We implement all multivariate empirical tests using the OLS regression. When the dependent variable is an indicator variable, we use a linear probability model because we control for security-level fixed effects in security-firm-year regressions. The results are consistent with our primary results when we implement logit regressions after dropping the security fixed effects.

difference between the maximum and minimum fair value of security j across all insurers, it captures the market opinion divergence and the potential opportunity for pricing switch. *Materiality*$_{i,j,t-1}$ is the ratio between fair value of security j and the total fair value of all securities of firm i, it captures the importance of the security to the insurer. *HImpairi*$_{,j,t-1}$ is an indicator variable that equals one if fair value estimate of the security is less than the carrying value, zero otherwise. Δ*Moderate*$_{ijt-1}$ is the change in the mode FV estimate of the security from year t-1 to t, we expect that the manager's pricing switch decision may be affected by changes in other insurers' FV estimates of the same security. We also control for five insurer-level attributes. *ROA*$_{i,t-1}$ is net income divided by total assets. *RBC*$_{i,t-1}$ is total adjusted capital divided by total risk-based capital. *% Carried FV* is the ratio of assets that is required to be carried at fair value (i.e., NAIC designation of 6) to fixed income assets. *Large* is an indicator variable that equals one if total assets is in the top quartile of the sample, zero otherwise. *Public* is an indicator variable that equals one if an upstream direct parent of an insurer is a public company, zero otherwise. Additionally, we control for firm-, year-, and security-level fixed effects to transforms the regressions into within-security regressions. Such design helps attenuate the potential bias on the coefficient estimates due to correlated omitted time-invariants firm and security characteristics.

Since we have two test variables (prior inflation and discount) with two dependent variables (upward and downward switch) under two explanations (FV opinion shopping and unbiased reporting), we tabulate in Appendix A the predictions for the coefficients in Models (1a) and (1b) for the eight possible combinations and their related hypotheses. Note that the benchmark group in both models comprise securities with on-target FV estimate in year t-1. Under both FV opinion shopping and unbiased reporting, we expect α_2>0 in Model (1a) and β_2<0 in Model (1b), so we have to rely on the sign for α_1 and β_1 to test H1a. Under unbiased reporting, the direction of switch should be opposite to the direction of prior bias, we expect to see $\alpha_1<0$ and $\beta_1>0$. Under FV opinion shopping, the manager may continue to switch up previously inflated securities and/or try to avoid switching down such securities, we expect $\alpha_1>=0$ and $\beta_1<=0$. Under unbiased reporting, we expect approximately the same frequency between the correction of a prior downward and upward bias, so we expect $\alpha_2 = \beta_1$ across Models (1a) and (1b) for H1b. In contrary, evidence of lower frequency to correct prior upward bias than downward bias ($\beta_1<\alpha_2$) and would be more consistent with FV opinion shopping. Similarly, under unbiased reporting, the manager should have the same incentive to avoid aggravating prior upward and prior downward bias, so we expect $\alpha_1 = \beta_2$ across Models (1a) and (1b) for H1c. Evidence that the manager is more likely to aggravate prior upward bias than prior downward bias ($\alpha_1> \beta_2$) would be consistent with FV opinion shopping. To further test the moderating effect of firm performance (H1d) and high-impairment-risk securities (H1e), we interact $RBC_{i,t-1}$ and $HImpair_{i,j,t-1}$, respectively, with both $Inflation_{i,j,t-1}$ and $Discount_{i,j,t-1}$ in Models (1a) and (1b).

Appendix A

			Unbiased Reporting		FV Opinion Shopping	
Model	Independent Variable	Coeff.	Upward Switch	Downward Switch	Upward Switch	Downward Switch
(1a)	$Inflation_{ijt-1}$	α_1	$\alpha_1<0$ (H1a)		$\alpha_1>=0$ (H1a)	
(1a)	$Discount_{ijt-1}$	α_2	$\alpha_2>0$ (H1a)		$\alpha_2>0$ (H1a)	
(1b)	$Inflation_{ijt-1}$	β_1		$\beta_1>0$ (H1a)		$\beta_1<=0$ (H1a)
(1b)	$Discount_{ijt-1}$	β_2		$\beta_2<0$ (H1a)		$\beta_2<0$ (H1a)
(1a) and (1b)			$\alpha_2= \beta_1$ (H1b)		$\alpha_2 > \beta_1$ (H1b)	
(1a) and (1b)			$\alpha_1= \beta_2$ (H1c)		$\alpha_1 > \beta_2$ (H1c)	

Next, to test the effect of pricing switch on FV estimate bias (H2a, H2b), we estimate the following OLS regression at the security-insurer-year level:

$$FV\ Difference_{i,j,t} = \alpha_0 + \alpha_1 Inflation_{i,j,t-1} + \alpha_2 Discount_{i,j,t-1} + \alpha_3 Upward\ Switch_{i,j,t}$$

$$+ \alpha_4 Downward\ Switch_{i,j,t} + Controls + Fixed\ Effects + \varepsilon_{i,j,t} \quad (2a)$$

$$FV\ Difference_{i,j,t} = \beta_0 + \beta_1 Inflation_{i,j,t-1} + \beta_2 Discount_{i,j,t-1} + \beta_3 Upward\ Switch_{i,j,t} * Inflation_{i,j,t-1}$$
$$+ \beta_4 Upward\ Switch_{i,j,t} * Discount_{i,j,t-1} + \beta_5 Upward\ Switch_{i,j,t} * Ontarget_{i,j,t-1}$$
$$+ \beta_6 Downward\ Switch_{i,j,t} * Inflation_{i,j,t-1} + \beta_7 Downward\ Switch_{i,j,t} * Discount_{i,j,t-1}$$
$$+ \beta_8 Downward\ Switch_{i,j,t} * Ontarget_{i,j,t-1} + Controls + Fixed\ Effects + \varepsilon_{i,j,t} \quad (2b)$$

$FV\ Difference_{i,j,t}$ is the fair value/par value of security j at insurer i minus the mode value of fair value/par value of the same security across all insurers in the same year t. It measures FV estimate deviation from the true value of the security. Positive (Negative) $FV\ Difference_{i,j,t}$ proxies for the inflated (deflated) portion of the FV estimate. In both Models (2a) and (2b), the benchmark group are all securities with on-target FV estimate in the prior year and without a pricing switch in the current year. For H2a, we expect that after the switch the extent of FV estimate bias is the same between securities with an upward and securities with a downward switch under unbiased reporting (i.e., $|\alpha_3|=|\alpha_4|$), but is greater for the former than the latter under FV opinion shopping (i.e., $|\alpha_3|>|\alpha_4|$).

In Model (2b), we further condition $Upward\ Switch_{i,j,t}$ and $Downward\ Switch_{i,j,t}$ on the direction of prior FV estimate bias. Coefficients β_1 (β_2) captures the average FV estimate bias for securities with previous inflation (discount) and without a switch in the current year. Coefficients β_4 (β_6) captures the difference in FV estimate bias between previously discounted (inflated) securities with an upward (a downward) switch, relative to previously discounted (inflated) securities without a switch. This difference measures the correction of prior bias after the switch. Under unbiased reporting, if the magnitude of upward bias is greater than that for downward bias without the switch (i.e., $|\beta_1|>|\beta_2|$), we would expect greater correction for the former than the later (i.e., $|\beta_6|>|\beta_4|$) (H2b), such that the extent of FV bias should be similar between inflated securities after a downward switch and discounted securities after an upward switch (i.e., $|\beta_1+\beta_6|=|\beta_2+\beta_4|$) (H2a). If FV opinion shopping incentive dominates, we would expect greater upward correction than downward correction ($|\beta_4|>|\beta_6|$) regardless of the size of β_1 compared to β_2. Furthermore, the extent of FV bias should be greater for previously discounted securities after an upward switch than previously inflated securities after a downward switch (i.e., $|\beta_2+\beta_4|>|\beta_1+\beta_6|$) (H2a).

We follow the aggregate portfolio fair value inflation determinant model of Hanley et al. (2018) and OTTI timeliness model of Khan et al. (2019) in specifying control variables. $Level2_{i,j,t}$ and $Level3_{i,j,t}$ are indicator variables for hierarchy level 2 and level 3 securities, respectively. $ROA_{i,t}$ is the return-on-assets. $RBC_{i,t}$ is the RBC ratio. $Asset_{i,t}$ is the logarithm of total assets. $Leverage_{i,t}$ is total liabilities divided by total asset. $Moderate_{j,t}$ is mode value of fair value/par value of security j across all insurers in year t, multiplied by 100. $Selfest_{i,j,t}$ equals one for self-estimated securities, zero otherwise. The specification also includes security-, firm-, and year-fixed effects.

To test the effect of pricing switch on the likelihood (H3a) and magnitude (H3b) of future impairment, as well as the moderating effect of high-impairment-risk securities (H3c), we estimate the following model with OLS regression:[28]

$$Impairment_{i,j,[t,t+1]}/Impairment\ Amount_{i,j,[t,t+1]} = \alpha+\beta_1 Upward\ Switch_{i,j,t} \quad (3)$$
$$+\beta_2 Downward\ Switch_{i,j,t}+\beta_3 Upward\ Switch_{i,j,t} * HImpair_{i,j,t-1}$$
$$+\beta_4 Downward\ Switch_{i,j,t} * HImpair_{i,j,t-1}+\beta_5\ HImpair_{i,j,t-1}$$
$$+Controls+Fixed\ Effects+\varepsilon_{i,j,t}$$

[28] We use linear probability regression when the dependent variable is $Impairment_{i,j,[t,t+1]}$ instead of logit regression because we control for security fixed effects when running the security-insurer-year regressions. When we use logit regressions, the results are consistent with our primary results.

where $Impairment_{i,j,[t,t+1]}$ equals one if there is an impairment recognition during the period t or t+1 for security j by insurer i, and zero otherwise. $Impairment\ Amount_{i,j,[t,t+1]}$ indicates 100 times the amount of impairment charge during the period t and t+1 deflated by the par value, and equals zero for securities without an impairment charge.[29]

Intuitively, the likelihood of an impairment should be mechanically reduced by an upward switch, and increased by a downward switch. For H3a, under unbiased reporting, we expect to see $\beta_1<0$ and $\beta_2>0$. However, under FV opinion shopping, the manager will engage in a downward switch only for securities less subject to impairment. We would expect $\beta_1<0$ and $\beta_2<=0$. We have no predictions on the coefficients when the dependent variable is $Impairment\ Amount_{i,j,[t,t+1]}$ (H3b). For H3c, we expect $\beta_3<0$ and $\beta_4=0$ if the pricing switch for high-impairment-risk securities is mainly motivated by FV opinion shopping. We supplement Models (2a) and (b) with insurer liquidity ratio ($Liquidity_{i,t}$) and number of insurers holding the same security in year t ($\#\ Holders_{i,t}$), we expect lower probability and magnitude of OTTI charges for more widely held and thus more liquid securities, but do not have prediction for insurer level liquidity.

In the last set of tests, we examine the reaction of monitoring stakeholders to pricing switch (H4). First, we test the auditor response and estimate the following OLS regression:

$$Log(Fees)_{i,t} = \alpha + \beta_1 Sum\_up_{i,t} + \beta_2 Sum\_down_{i,t}$$
$$+\beta_3 Sum\_noswitch_{i,t} + Controls + Year\ Fixed\ Effects + \varepsilon_{i,j,t} \quad (4a)$$

where $Log(Fees)_{i,t.}$ is the logarithm of total audit fees in year t. Our main variable of interest, $Sum\_up_{i,t}$ ($Sum\_down_{i,t}$, $Sum\_noswitch_{i,t}$) is the sum of the value of fixed income securities with

[29] Alternatively, we also use 100 times the amount of impairment during period t and t+1 deflated by the par value minus the median value of this variable across all insurers holding the same security. The results are consistent. We use par value as the denominator, since actual cost and book adjusted carrying value are the amount already adjusted for other-than-temporary impairment.

an upward switch (downward switch, no switch) during the current year scaled by total assets. Our coefficients of interest is β_1. If the auditor perceives highest audit risk from upward switch, we expect to see $\beta_1>0$.

We include several control variables that are associated with audit fees in insurance industry (Pearson and Trompeter 1994; O'Sullivan and Diacon 2002). $Other\ Asset_{i,t}$ is the logarithm of assets other than fixed income securities. $Big\ 4_{i,t}$ equals one if the firm is audited by a Big 4 audit firm, zero otherwise. $Stock_{i,t}$ equals one if the firm belongs to a stock company, zero otherwise. $\#\ Subsidiaries_{i,t}$ is the number of subsidiaries in year t. $Public_{i,t}$ equals one if the insurer is a public company or is a subsidiary of public company, zero otherwise. $Leverage_{i,t}$ is the total liabilities divided by total assets in year t.

To test whether the auditor conditions audit fees based on whether the pricing switch is potentially motived by unbiased reporting or FV opinion shopping, we further break the three switch variables, $Sum\_up_{i,t}$, $Sum\_down_{i,t}$, and $Sum\_noswitch_{i,t}$, into cases where prior FV estimates were inflated, discounted, and on target compared to the mode value:

$$\begin{aligned}
&Log(Investment\ Fees)_{i,t} = \alpha+\beta_1 Sum_up_inf_{i,t}+\beta_2 Sum_up_dis_{i,t} \\
&+\beta_3 Sum_up_ont_{i,t}+\beta_4 Sum_down_inf_{i,t} +\beta_5 Sum_down_dis_{i,t} \qquad (4b)\\
&+\beta_6 Sum_down_ont_{i,t} +\beta_7 Sum_noswitch_inf_{i,t}+\beta_8 Sum_noswitch_dis_{i,t} \\
&+\beta_9 Sum_noswitch_ont_{i,t}+Controls+Year\ Fixed\ Effects +\varepsilon_{i,j,t}
\end{aligned}$$

where the suffix *_inf*, *_dis*, and *_ont* indicate whether the corresponding securities have FV estimate that was inflated, discounted, or on target compared to its mode value, respectively, in year t-1. The auditor will perceive an upward switch as less justified and charge higher fees if the switch does not serve to correct prior downward bias in FV estimates. This analysis provides evidence on whether the auditor's risk assessment of pricing switch depends on whether the switch is well justified.

Last, we test the credit rating agency response to pricing switch by estimating the following OLS regression:

$$Best\ Rating_{i,t+1}/Weiss\ Rating_{i,t+1} = \alpha + \beta_1 Log(Sum\_up)_{i,t} + \beta_2 Log(Sum\_down)_{i,t}$$
$$+ \beta_3 Log(Sum\_noswitch)_{i,t} + Control + Year\ Fixed\ Effects + \varepsilon_{i,j,t+1} \quad (4c)$$

where *Best* (*Weiss*) $Rating_{i,t+1}$ is credit rating for the next period provided by A.M. Best (Weiss) rating agency, which provides ratings on insurance companies (banks, credit unions, and insurance companies). Higher rating implies lower credit risk and better quality. *Log(Sum_up)* (*Log(Sum_down), Log(Sum_noswitch)*) is the logarithm of sum of values of fixed income securities with an upward switch (downward switch, no switch) during the current year. Our coefficients of interest are β_1, β_2, and β_3. If the credit analysts apply higher credit risk on upward pricing switch, we expect to see $\beta_1 < \beta_2$, and $\beta_1 < \beta_3$.

In addition to variables in (4a), following Pottier and Sommer (1999) and Adams et al. (2003), we additionally include with RBC ratio ($RBC_{i,t}$), logarithm of premium income *(Log(Premium income))*, and an indicator variable that equals one if more than 50 percent of the business is generated from outside the core business (i.e., Life insurance and annuity contracts), zero otherwise (*Noncore*).

3.2. Data Overview

We use NAIC Schedule D disclosures of Life insurers from 2014 to 2017, which provide the fair value, par value, estimation source, and hierarchy level of each security across firms. The initial sample covers 1,885,072 security-insurer-years. After excluding observations with missing variables, the sample is reduced to 1,110,733 security-insurer-years.[30] We require that at least five insurers hold the same security at period t (Hanley et al. 2018), and that there are at least 2 external pricing sources for the same security-year. Moreover, we further restrict that the level hierarchy of a security does not change across periods, to mitigate the concern that the change in FV difference may be driven by the change in level input, rather than the change in pricing source input. Our final sample includes 631,928 security-insurer-year observations from 1,866 unique insurer-year observations. Additionally, we hand-collect credit ratings information from the website of A.M. Best and Weiss ratings, which is composed of a total 21 and 16 ratings, respectively. We assign a value of 1 to the lowest rating of c (F), and a value of 21 (16) to the highest rating of aaa (A+).[31]

Table 1 Panel A provides the summary statistics for variables used in the analyses. The distribution on *FV Difference*$_{i,j,t}$ is positively skewed, with the mean value (0.029) being higher than the median (0.000). The mean of *Pricing Switch*$_{i,j,t}$ indicates that 12.4% of the security-insurer-years in the sample has a different estimation source from the prior year. Each year, about 3.7% of securities are upwardly switched (*Upward Switch*) while 3.5% are downwardly switched (*Downward Switch)*. Consistent with Hanley et al. (2018), level 2 securities (*Level 2*) account for the majority (94.8%) of the security-insurer-years. Although 28.8% of securities are subject to high probability of impairment (*HImp*), only 0.6% of securities have impairment charges during year t and t+1 (*Impairment*). The average impairment amount is 0.096% and 16.28% of the par value (*Impairment Amount*) for the full sample and for securities with recognized impairment, respectively. Each year 7.3% of securities are self-estimated (*Selfest*). For the same security each

[30] Since we acquire the insurers statutory filing data from 2014, all change variables and lagged variables are missing for 2014 due to the lack of data for 2013.
[31] There are some major differences between A.M. Best and Weiss rating agency. First, A.M. Best is a nationally recognized statistical rating organization (NRSRO) that issues credit ratings which SEC permits other financial firms to use for certain regulatory purposes, while Weiss is a non-NRSRO. Second, Weiss primarily relies on public financial statements, while A.M. Best incorporates private information from senior management and owners as well as public information. Third, Weiss is paid by the end-users, while A.M. Best is paid by the issuers.

year, there are, on average, 17 holders (*#Holders*) and 7 different external pricing sources at the same point in time (*#Pricing Source*). The mean difference between the highest and lowest pricing source is 2.2% of par value (*Spread*), suggesting very divergent opinions among different pricing sources and potential opportunities for a pricing switch motivated by either FV opinion shopping or unbiased reporting. Among the 1,866 insurer-years, about 10.4% are subject to financial examination by regulator (*Financial examination*), 64.8% are audited by Big 4 auditors (*Big 4*) and 86.1% use external investment advisors.

Table 1 Panel B reports the frequency distribution of pricing sources. The majority (82%) of securities are priced by external pricing services. Within the switch sample, the proportion of securities priced by pricing services increases from 83% before the switch to 89% after switch, while the proportion of securities priced by brokers and custodians decreases from 16% to 11%. Panel C shows that overall, ICE (Intercontinental Exchange) is the leading valuation service, accounting for 47% of the securities using pricing services, followed by Reuters (8%) and Barclays (5%). Panel D shows that within the subsample that are switched from one to another pricing service, ICE takes the lead for both before and after the switch, although its share slightly declines. Such statistics suggest that the fixed income pricing service market has a structure similar to the audit market in that the top 5 pricing services account for 67% of the market share.

[Insert Table 1 here]

4. Empirical Findings

4.1. The Determinants of Pricing switch

The Table 2 Panel A (Panel B) reports the percentage of security-insurer-years (insurer-years) with upward switch and downward switch categorized by whether their FV estimate in year t-1 was inflated, discounted, or on-target. Panel A shows that securities with prior FV inflation more likely have a downward switch (1.9%) than an upward switch (0.4%), while the opposite is true for securities with previous discount (0.3% for a downward switch and 2.3% for an upward switch). For securities with previous on-target FV estimate, its probability of an upward switch (1.0%) is similar to the probability of a downward switch (1.3%). Panel B shows that pricing switch is widespread among insurers. Consistent with Panel A, the direction of the pricing switch also exhibits a pattern opposite to the direction of previous bias at the insurer-year level.[32]

Panel C reports the regression results on the determinants of pricing switch based on Models (1a) and (1b). In Column (1), when the dependent variable is any pricing switch (*Pricing Switch*), we find that both *Inflation* and *Discount* load positively at the 1% significance level, suggesting that relative to securities with previous on-target FV estimate, securities with prior inflation or discount are more likely to have a pricing switch. Recall that under unbiased reporting, the direction of switch should be opposite to the direction of prior bias under H1a. In Column (2) when *Upward Switch* is the dependent variable, we find both *Inflation* and *Discount* load positively at the 1% significance level, consistent with FV opinion shopping for the former and unbiased reporting for the later, respectively. In Column (3) when *Downward Switch* is the dependent variable, we find *Inflation* and *Discount* loads positively and negatively at the 1% significance level, respectively. We interpret both as being consistent with unbiased reporting.

Recall that that under unbiased reporting, the frequency should be the similar between the correction of a prior downward bias and the correction of a prior upward bias based on H1b. Test of coefficient at the bottom of Table 2 Panel C shows that the coefficient for *Discount* in Column (2) (0.111) is significantly greater than that for *Inflation* in Column (3) (0.084) ($\chi 2$ =312.43),

[32] The total the number of insurers in Panel B (1,529+1,445+1,779=4,753) exceeds the total number of unique insurer-year observations in Table 1 Panel A (1,864), since each insurer could have all three types of securities during the same year.

suggesting the manager is less likely to correct prior upward bias than prior downward bias. Under unbiased reporting, the manager should try to avoid aggravating prior upward bias to the same extent as to avoid aggravating prior downward bias based on H1c. However, test of coefficient shows that the coefficient for *Inflation* in Column (2) (0.002) is significantly greater than that for *Discount* in Column (3) (-0.014) ($\chi 2$ =513.30), suggesting stronger incentives to exacerbate prior upward bias than prior downward bias. Collectively, the evidence suggests that although pricing switch can be explained by unbiased reporting, it also exhibits strong patterns that are highly consistent with FV opinion shopping. Among the control variables, we find that the probability of an upward switch is higher for securities more important to the insurer (*Materiality*), high-impairment-risk securities (*HImp*), and public insurers (*Public*), and lower for insurers with better financial performance (*ROA*) and greater regulatory capital (*RBC*). The probability of a downward switch is lower for high-impairment-risk securities (*HImp*) and public insurers (*Public*), and higher for insurers with better performance (*ROA*). In addition, larger insurers (insurers with more securities carried at fair value) are less (more) likely to engage in either (both) type of switch.[33]

We next explore how the pricing switch decision varies with firm financial performance and the impairment risk of the security. In Column (4), we find the coefficient on *RBC*, *Inflation**RBC*, and *Discount**RBC* are all negative and significant at the 1% level, suggesting firms with lower RBC ratio are more likely to engage in an upward switch, irrespective of whether the prior FV estimate of the security was on target, inflated, or discounted. It implies that risk-based capital management incentive plays an important role for the upward switch decision. In Column (5), we find the coefficients on *RBC*, *Inflation**RBC*, and *Discount**RBC* are all

[33] We also estimate Columns (1)-(3) of Table 2 Panel C using logistic regression after controlling for year fixed effects and obtain similar results. We could not control for firm (security) fixed effects since some firms (securities) never had a pricing switch during the sample period.

statistically insignificant, suggesting little impact from regulatory capital incentive on the downward switch decision. In Column (6), the coefficients on *HImp* and *Inflation*HImp* are both statistically insignificant. However, the coefficient on *Discount*HImp* is positive and significant at the 1% level. This result implies that compared to other securities with prior FV discount, the likelihood of an upward switch is even higher if the security is subject to high impairment risk. This evidence supports the interpretation that managers attempt to avert the impairment recognition of high-impairment-risk securities through an upward switch. In Column (7), the coefficient on *Inflation*HImp* and *Discount*HImp* is negative and significant at the 10% and 1% level, respectively, implying that the manager is incrementally less inclined to engage a downward switch for high-impairment-risk securities compared to other securities with prior inflated or discounted FV estimates. In sum, evidence from Columns (4)-(7) indicates that concerns for regulatory capital and impairment risk strengthen managers' incentives to engage in FV opinion shopping, as such interaction effect should not be expected under unbiased reporting incentive.[34]

[Insert Table 2 here]

4.2. The Effect of Pricing Switch on the Quality of Fair Value Estimation

Table 3 Panel A reports the effect of the pricing switch on FV estimate bias. Column (1) represents the regression results based on Model (2a). Recall that the benchmark group are securities with on-target FV estimate without a switch. The significantly positive (negative) coefficient on *Upward Switch* (*Downward Switch*) implies that the FV estimate of securities with an upward (a downward) switch is more upwardly (downwardly) biased. Importantly, the absolute value of the coefficient on *Upward Switch* is significantly greater than that for *Downward Switch* (|0.368|>|-0.313|, F=62.00). This finding implies that, on average, upward switch leads to a greater

[34] As indicated by tests of coefficients at the bottom of Table 2 Panel C, our inferences for H1b and H1c continue to hold in Columns (4)-(7).

magnitude of bias in FV estimate than a downward switch does. In Column (2) after we include the six interaction terms, the absolute value of the coefficient on *Inflation* is significantly greater than that for *Discount* (|0.147|>|-0.089|, F=151.36), suggesting that the magnitude of upward bias is greater than that of downward bias for securities without a switch. Despite this, we find that the magnitude of upward adjustment is greater than that of downward adjustment, as evidenced in the significantly greater absolute value for the coefficient on *Upward Switch * Discount* than that on *Downward Switch * Inflation* (i.e., |0.216|>|-0.176|) (F=20.43). After the switch, the extent of FV bias for previously discounted securities with an upward switch (-0.089+0.216=0.127) is significantly greater than that for previously inflated securities with a downward switch (0.147-0.176= -0.029) (|0.127|>|-0.029|, F=121.24). Overall, these results reveal that compared to prior upward bias, downward bias experiences significantly greater magnitude of correction despite that downward bias is of smaller magnitude than upward bias before the correction. After such asymmetric correction, an upward switch leads to more biased FV estimate than a downward switch does. We interpret these results as more consistent with FV opinion shopping than unbiased reporting. In Columns (3)-(5), we partition the sample based on hierarchy input levels 1, 2, and 3, respectively, and find that our main results are primarily driven by securities with level 2 inputs.

Across Columns (1) and (2), we find that FV difference is lower for securities with Level 3 (*Level 3*) inputs and securities with higher mode FV (*Moderate*), for insurers with higher RBC (*RBC*), larger total assets (*Assets*), higher leverage ratio (*Leverage*). Consistent with Hanley et al. (2018), we find that FV difference is higher for securities with self-estimated values (*Selfest*).

We further examine how the effect of pricing switch on FV estimate bias varies with insurer RBC ratio, the impairment risk of the security, and the presence of three stakeholders: regulatory examination by the state insurance regulator (*Financial Examination*), Big 4 auditors (*Big 4*), and external asset advisor (*External*). We set Low RBC to one for observations with in the lowest quartile RBC ratio, zero otherwise. In Table 3 Panel B, we re-estimate Column (1) of Panel A after successively including these five cross-sectional variables and their interactions with *Upward Switch* and *Downward Switch*. We find that the coefficient on *Upward Switch*CS* is negative and significant at the1% level when CS equals *Big 4* or *External Advisor*, and is positive and significant at the 1% level when CS equals *Low RBC* or *HImp*. This results suggest that FV opinion shopping via an upward switch is constrained by the use of Big 4 auditors and the external investment advisors, but is exacerbated when the insurer faces strong capital constraints and the security is more subject to impairment risk. Consistently, the coefficient on *Down Switch*CS* is negative and significant at the1% level when CS equals *External Advisor*, and is positive and significant at the 1% level when CS equals HImp, implying that the magnitude of downward adjustment is greater when the insurer uses an external advisor, but is less if the security is subject to high impairment risk. We fail to find any interaction effect between either type of switch with *Financial Examination*. In sum, these results suggest that Big 4 auditors and external managers help constrain FV opinion shopping behavior, but concerns for capital constraints and high impairment risk of the security may exacerbate FV opinion shopping.

[Insert Table 3 here]

4.3. The Effect of Pricing Switch on Future Impairment Recognition

Table 4 Panel A reports the evidence on the effect of a pricing switch on the likelihood of an OTTI recognition in period t to t+1.[35] We first estimate Model (3) with logistic regression in Column (1). As expected, the coefficient for *Upward Switch* is negative and significant at the 1% level, suggesting an upward switch effectively reduces the likelihood of an OTTI charge. Recall

[35] We also perform all the analyses in Table 5 using OTTI impairment recognized during the period t to t+2 and find qualitatively similar results.

that under unbiased reporting, a downward switch should mechanically increase the probability of an impairment recognition. However, the coefficient for *Downward Switch* is negative and insignificant, which is more consistent with FV opinion shopping in that the manager will engage in a downward switch only if it does not trigger the impairment recognition. We observe similar results in Column (2) when we re-estimate the model with OLS regression, or in Column (3) when we further control for firm fixed effects in the OLS regression. In Columns (4)-(6), we repeat the same estimations as in Columns (1)-(3) but after including the interaction terms *Upward Switch*HImp* and *Downward Switch*HImp*, their coefficients captures the incremental effects of an upward and a downward switch for the likelihood of an impairment charge. Across Columns (4)-(6), the coefficient for *Upward Switch*HImp* is negative and significant at the 1% level, suggesting an upward switch incrementally reduces the probability of an impairment charge. In fact, absent an upward switch, high-impairment-risk securities are more likely to have an impairment recognition, as evidenced in the positive and highly significant coefficient for *HImp* across the six columns.[36] Tests of coefficient at the bottom of Panel A indicate that the coefficient sum *HImp* + *Upward Switch*HImp* is not significantly different from zero (F= 0.18, F= 0.05, F= 1.91, in Columns (4), (5), (6), respectively). This implies that an upward switch effectively reduces the probability of an impairment charge for high-impairment-risk securities to a level comparable to that of low-impairment-risk securities. Among the control variables, the probability of an impairment charge increases for level 3 securities (*Level 3*), and decreases for securities with more holders (*#holder*) and thus are more liquid, and for self-estimated securities (*Selfest*).

[36] Based on the coefficient estimates on *Himp* in Columns (5)-(6), absent an upward switch, high-impairment risk securities experience a 0.7% higher likelihood of an impairment recognition compared with low-impairment risk securities, it is a significant increase given that the mean probability of an OTTI recognition is 0.6% for the full sample.

Table 4 Panel B presents the effects of the pricing switch on the magnitude of impairment charge in the current and subsequent period using OLS regressions. The regressions specification in Columns (1)-(2) ((3)-(4)) is the same as that of Columns (2)-(3) ((5)-(6)) in Panel A, except that the dependent variable is *Impairment Amount*. In Columns (1)-(2), the coefficient for *Upward Switch* is negative and significant at the 1% level, consistent with an upward switch effectively reducing the impairment amount. Consistent with Panel A, the coefficient for *Downward Switch* is negative or insignificant. Such negative coefficient for *Upward Switch* is further strengthened for high-impairment-risk securities, as evidenced in the coefficients for *Upward Switch* * *HImp* in Columns (3)-(4) being negative and significant at the 10% or better. Not surprisingly, absent a pricing switch, high-impairment-risk securities experience at least 0.2% greater magnitude of impairment charge as a percentage of par value relative to low-impairment-risk securities, as evidenced in the positive and significant coefficient for *HImp* across the four columns. Based on Columns (3) and (4), an upward switch effectively reduces the magnitude of impairment recognition by 0.10% and 0.08% of par value, respectively, compared to high-impairment-risk securities without a switch. Tests of coefficient at the bottom of Panel B indicate that the coefficient sum *HImp* + *Upward Switch*HImp* is significantly positive (F=3.78, F=5.74 in Columns (3), (4), respectively), suggesting that an upward switch does not entirely eliminate the higher impairment magnitude of high-impairment-risk securities compared to low-impairment-risk securities, possibly because the impairment of the former accumulates as the impairment recognition becomes over-due.[37]

[37] Since the dependent variable is left censored data, in a sensitivity test, we re-estimate Table 4 Panel B using Tobit regressions to simultaneously capture the decision to report an impairment and the amount of the impairment (Riedl 2004). Tobit regression is appropriate when the dependent variable is censored data (Wooldridge 2002). Consistent with Panel B, in untabulated tests, the coefficient for *Upward Switch* is -0.072 (t=-3.01) in Column (1), and the coefficient for *Upward Switch*HImp* is -0.109 (t=-2.17) in Column (3). Because the theoretical properties of firm fixed effects Tobit regression is subject to debate (Roman and Rebollo-Sanz 2017), we control for year fixed effects but not firm fixed effects in the Tobit regression.

Overall these findings imply that an upward switch effectively delays the recognition and reduces the magnitude of the impairment charge, particularly for securities with high impairment risk. However, we fail to find any evidence that a downward switch increases the probability or magnitude of impairment recognition. These asymmetric effects of an upward and a downward switch on impairment charge provide further evidence that the pricing switch could be opportunistic.

[Insert Table 4 here]

4.4. Audit Pricing and Credit Rating

In the final section, we examine the response from the external auditor and the rating agency to the pricing switch. Table 5 reports the regression results of Model (4a) on the relation between audit fees and the proportion of securities with an upward switch (*Sum_up*), with a downward switch (*Sum_down*), and without a switch (*Sum_noswitch*) during the current year. In Column (1), the coefficient for *Sum_up* is 4.695 and significant at the 1% level, suggesting that the auditor charges higher total fees for firms with greater proportion of securities with an upward switch. Based on Colum (1), as *Sum_up* increases by one standard deviation (0.093), total audit fees will increase by 54.7%, or $87,965 of the sample mean value of $160,813 total audit fees.

In Column (2), we perform the analysis based on Model (4b) by segregating the pricing switch based on the prior inflation, discount and on-target classification of the securities. Because this test conditions the switch on the direction of prior bias, it provides clearer picture on whether the auditor's risk assessment of pricing switch depends on whether the switch seems justified by prior bias. We find that among the upward switch group, the auditor charges higher fees only for securities with inflated or on-target fair value estimates in the prior period, as evidence by the positive coefficients on *Sum_up_inf* and *Sum_up_ont*, which is significant at the 5% level, but not for previously discounted securities as evidenced by the insignificant coefficients on $Sum\_up\_dis_{i,t}$. This evidence suggests that the auditor perceives that the upward switch is justified if the fair value estimate of the security was downwardly biased, but is less justified if the fair value estimate of the security was already on target or inflated in the prior period. Among securities without a switch, the auditor charges higher audit fees for inflated securities ($Sum\_noswitch\_inf_{i,t}$) and on-target securities ($Sum\_noswitch\_ont_{i,t}$). Overall, results in Table 5 indicate that the auditor not only responds to the risk associated with the pricing switch through audit fee adjustment, but also make the audit fee adjustment according to the potential motivation behind the switch decision.

[Insert Table 5 here]

In Table 6, we report the OLS regression results on the association between credit ratings and the dollar amount of securities with an upward switch (*Log(Sum_up)*), with a downward switch (*Log(Sum_down)*), and without a switch (*Log(Sum_noswitch)*) based on Model (4c). We find that the coefficient for *Log(Sum_up)* is negative and weakly significant and insignificant in Columns (1) and (2) when Weiss rating and A.M. best rating is the dependent variable, respectively. Thus, we find weak evidence that rating agencies assign lower credit rating for insurers with greater dollar amount of upwardly switched securities. However, it does not mean that rating agencies fail to incorporate the implications of pricing switch. Specifically, the coefficient for *Log(Sum_noswitch)* is 0.048 and significant at the 1% in both Columns (1) and (2), suggesting higher credit rating for greater dollar amount of securities without a pricing switch. Tests of coefficient at the bottom of Table 6 show that the coefficient for *Log(Sum_up)* is significantly lower than that for (*Log(Sum_noswitch)*) (F=14.71 and F=19.37 in Columns (1) and (2), respectively). This contrast reveals that although greater magnitude of securities without a switch help enhance credit rating, greater magnitude of upwardly switched securities do not yield the same benefit. We also find that the coefficient on *Log(Sum_down)* is significantly smaller than that on *Log(Sum_noswitch* (F=7.50 and F=14.62 in Columns (1) and (2), respectively). Together, these findings support the notion that rating agencies distinguish between securities with and without a pricing switch and perceives greater information risk for the former than the latter. Among the control variables, we find that the credit rating is higher for insurers with greater amount of Other assets (*Log(Other assets)*) and greater RBC ratio, suggesting higher rating for insurers with greater financial strength.[38]

[Insert Table 6 here]

5. Conclusion

In this study, we examine the causes and consequences of pricing switch by Life insurers. We find evidence that pricing switch could be explained by both unbiased reporting and FV opinion shopping, and is more consistent with FV opinion shopping when the switch is engaged by financially weak insurers and for securities with high impairment risk. Regarding the consequences, we find evidence that compared to a downward switch, an upward switch leads to both greater magnitude of adjustment to FV estimate and greater extent of FV estimate bias after the switch. Such asymmetric effects between an upward and a downward switch is mitigated by the presence of Big 4 auditors and external advisors, but is exacerbated by strong regulatory capital constraints and high impairment risk of the security. An upward switch effectively reduces the likelihood and the magnitude of impairment charges, particularly for securities with high impairment risk, but a downward switch does not increase the likelihood or magnitude of impairment charges. The external auditor responds to the risk of FV opinion shopping by increasing audit fees for securities with an upward switch, and such fee increase further depends

[38] Several control variables load differently between A.M. Best and Weiss ratings. Previous studies also document insurer rating discrepancies among rating agencies (Adams et al. 2003; Pottier and Sommer 1999).

on whether the upward switch seems justified. Although we find weak evidence that rating agencies assess higher credit risk for securities with pricing switch, we find strong evidence that rating agencies greatly discount securities with a pricing switch relative to securities without a pricing switch in assigning credit rating.

In summary, we provide evidence that the manager exhibits FV opinion shopping behavior in the selection of third-party pricing sources. The incentive to comply with regulatory capital requirement and to delay impairment charge could be the driving forces behind FV opinion shopping, which is also associated with certain monitoring costs. Future research could explore other benefits and costs associated with FV opinion shopping. Such exploration will help us to deepen our understanding of the pricing switch decision.

References

Adams, M., Burton, B., Hardwick, P. 2003. The determinants of credit ratings in the United Kingdom insurance industry. Journal of Business Finance & Accounting 30 (3), 539-572.

Altamuro, J., Zhang, H., 2013. The financial reporting of fair value based on managerial inputs versus market inputs: evidence from mortgage servicing rights. Review of Accounting Studies 18 (3), 833-858.

Ayres, D. 2016. Fair value disclosures of level three assets and credit ratings. Journal of Accounting and Public Policy 35 (6), 635-653.

Bennett, N., 2014. Regulatory capital requirements for U.S. life insurers. https://www.actuary.org/sites/default/files/files/Regulatory_Capital_Requirements_US_Life_Insurers_6-17-14.pdf.

Board IQ, 2016. Finding fair value. https://assets.kpmg/content/dam/kpmg/us/pdf/2016/12/finding-fair-value.pdf.

Bratten, B., Gaynor, L.M., McDaniel, L., Montague, N.R., Sierra, G.E., 2012. The audit of fair values and other estimates: the effects of underlying environmental, task, and auditor-specific factors. AUDITING: A Journal of Practice & Theory 32 (Suppl. 1), 7-44.

Deloitte, 2015. Fair value pricing survey executive summary, thirteenth edition. https://www2.deloitte.com/content/dam/Deloitte/us/Documents/financial-services/us-fsi-2015-deloitte-fair-valuation-pricing-survey-thirteenth-edition.pdf.

Deloitte, 2017. Fair valuation pricing survey executive summary: fifteenth edition. https://www2.deloitte.com/content/dam/Deloitte/us/Documents/financial-services/us-fsi-fair-valuation-pricing-survey-fifteenth-edition.pdf.

Deloitte, 2018. Fair valuation pricing survey executive summary: sixteenth edition. https://www2.deloitte.com/content/dam/Deloitte/us/Documents/financial-services/us-fsi-Deloitte%27s-Fair-Valuation-Pricing-Survey-Exec-Summary-16th-Edition.pdf.

Doherty, N.A., Kartasheva, A.V., Phillips, R.D. 2012. Information effect of entry into credit ratings market: The case of insurers' rating. Journal of Financial Economics 106 (2), 308-330.

Duffie, D., Lando, D., 2001. Term structures of credit spreads with incomplete accounting information. Econometrica 69 (3), 633-664.

Easley, D., O'Hara, M., 2004. Information and the cost of capital. Journal of Finance 59 (4), 1553-1583.

Edwards, A., Harris, L., Piwowar, M., 2007. Corporate bond market transaction costs and transparency. The Journal of Finance 62 (3), 1421-1451.

Ellul, A., Jotikasthira, C., Lundblad, C.T., Wang, Y. 2014. Mark-to-market accounting and systematic risk: evidence from the insurance industry. Economic Policy 29 (78), 297-341.

Ettredge, M.L., Xu, Y., Yi, H.S., 2014. Fair value measurements and audit fees: evidence from the banking industry. Auditing: A Journal of Practice & Theory 33 (3), 33–58.

FASB, 2011. Fair value measurements (topic 157): amendments to achieve common fair value measurement and disclosure requirements in U.S. GAAP and IFRSs.

Gaver, J.J. and Paterson, J.S. 2000. Earnings management under changing regulatory regimes: state accreditation in the insurance industry. Journal of Public Accounting and Policy 19 (4-5), 390-420.

Glover, S., Taylor, M., Wu, Y.J. 2017. Current practices and challenges in auditing fair value measurements and complex estimates: Implications for auditing standards and the academy. *Auditing: A Journal of Practice & Theory* 36 (1), 63–84.

Goh, B.W., Li, D., Ng, J., Yong, K.O., 2015. Market pricing of banks' fair value assets reported under SFAS 157 since the 2008 financial crisis. Journal of Accounting and Public Policy 34 (2), 129–145.

Halek, M., Eckles, D.L., 2010. Effects of analysts' ratings on insurer stock return: evidence of asymmetric responses. The Journal of Risk and Insurance 77 (4), 801-827.

Hanley, K.W., Jagolinzer, A.D., Nikolova S., 2018. Strategic estimation of asset fair values. Journal of Accounting and Economics 66 (1), 25-45.

Hodder, L., P. Hopkins, and K. Schipper. 2014. Fair value measurement in financial reporting. Foundation and Trend in Accounting 8 (3-4), 144-270.

Hollifield, B., Neklyudov, A., Spatt, C., 2017. Bid-ask spreads, trading networks, and the pricing of securitizations. The Review of Financial Studies 30 (9), 3048-3085.

Houlihan Lokey, 2016. Independent third-party valuation insights: portfolio valuation best practices. https://www.hl.com/uploadedFiles/50_Newsroom/43_Insights_and_Ideas/Valuation%20Best%20Practices_Houilhan%20Lokey.pdf.

Jarva, H., 2009. Do firms manage fair value estimates? An examination of SFAS 142 goodwill impairments. Journal of Business Finance & Accounting 36 (9–10), 1059–1086.

Joe, J.R., Vandervelde, S.D., Wu, Y. J., 2017. Use of high quantification evidence in fair value audits: do auditors stay in their comfort zone? The Accounting Review 92 (5), 89–116.

Johnson, S., 2007. PCAOB: Can auditors handle fair value? https://www.cfo.com/accounting-tax/2007/06/pcaob-can-auditors-handle-fair-value.

Jones, D. A., and Smith, K. J. 2011. Comparing the value relevance, predictive value, and persistence of other comprehensive income and special items. The Accounting Review 86 (6), 2047–2073.

Kaplan, R.S., 2011. Accounting scholarship that advances professional knowledge and practice. The Accounting Review 86 (2), 367–383.

Ketz, J.E., 1999. Comprehensive income: What do the numbers disclose? The Journal of Corporate Accounting & Finance 10 (4), 79-96.

Khan, U., Ryan, S., Varma, A., 2019. Fair value versus amortized cost measurement and the timeliness of other-than-temporary impairments: evidence from the insurance industry. The Accounting Review 94 (6), 285-307.

KPMG, 2017. Fair value measurement: questions and answers. https://assets.kpmg/content/dam/kpmg/xx/pdf/2017/12/fair-value-qa-2017.pdf.

Lambert, R., Leuz, C., Verrecchia, R.E., 2007. Accounting information, disclosure, and the cost of capital. Journal of Accounting Research 45 (2), 385-420.

Laux, C., Leuz, C., 2009. The crisis of fair-value accounting: making sense of the recent debate. Accounting, Organizations and Society 34 (6-7), 826-834.

Magnan, M., Parbonetti, A., 2015. Fair value accounting: information or confusion for financial markets? Review of Accounting Studies 20 (1), 559-591.

Martin, R.D., Rich, J.S., Wilks, T.J., 2006. Auditing fair value measurements: a synthesis of relevant research. Accounting Horizons 20 (3), 287–303.

May, A.D., 2010. The impact of bond rating changes on corporate bond prices: new evidence from the over-the-counter market. Journal of Banking & Finance 34 (11), 2822–2836.

NAIC, 2016. Financial analysis handbook: 2015 annual & 2016 quarterly: Volume 1.

NAIC Blanks (E) Working Group, 2016. Annual statement instructions - life, health, property, fraternal and title: general interrogatories.
NAIC, 2017a. Official NAIC annual statement blank: life, accident & health.
NAIC, 2017b. Statutory issue paper no. 157: Use of net asset value.
NAIC Capital Markets Bureau, 2011. Analysis of insurance industry investment portfolio asset mixes. https://www.naic.org/capital_markets_archive/110819.htm.NAIC Capital Markets
Bureau, 2017. U.S. insurer invested asset other-than-temporary impairments as of year-end 2015. https://www.naic.org/capital_markets_archive/170118.htm.
NYSE, 2007. NYSE Bonds. New York Stock Exchange, New York, NY.
O'Sullivan, N., Diacon, S.R., 2002. The impact of ownership, governance and non-audit services on audit fees: evidence from the insurance industry. International Journal of Auditing 6 (1), 93–10.
PCAOB. 2010. Report on 2009 inspection of KMPG LLP. https://pcaobus.org/Inspections/Reports/Documents/2010_KPMG_LLP.pdf.
PCAOB. 2011. Report on 2010 Inspection of PricewaterhouseCoopers LLP. https://pcaobus.org/Inspections/Reports/Documents/2011_PricewaterhouseCoopers_LLP.pdf.
Pearson, T., Trompeter, G., 1994. Competition in the market for audit services: the effect of supplier concentration on audit fees. Contemporary Accounting Research 11 (1), 115–135.
Petroni, K.R., 1992. Optimistic reporting in the property- casualty insurance industry. Journal of Accounting and Economics 15 (4), 485–508.
Pottier, S.W., Sommer, D.W. 1999. Property-liability insurer financial strength ratings: Difference across ratings agencies. The Journal of Risk and Insurance 66 (4), 621-642.
PWC, 2010. Asset management: valuation survey. https://www.pwc.com/gx/en/asset management/assets/asset-management-valuation-survey.pdf.
Ramanna, K and R.Watts. 2012. Evidence on the use of unverifiable estimates in required goodwill impairment. Review of Accounting Studies 17 (4), 749-780.
Riedl, E. 2004. An examination of long-lived asset impairments. The Accounting Review 79 (3), 823-852.
Salzsieder, L., 2016. Fair value opinion shopping. Behavioral Research in Accounting 28 (1), 57–66.
Roman, S. G., Rebollo-Sanz, Y. F. 2017. An estimation of worker and firm effects with censored data. *Bulletin of Economic Research* 70 (4), 459-482.
Securities and Exchange Commission (SEC). 2008. Report and recommendations pursuant to section 133 of the emergency economic stabilization Act of 2008: study on mark-to-market accounting.
Securities and Exchange Commission (SEC), 2016. Valuation guidance: frequently asked questions. https://www.sec.gov/divisions/investment/guidance/valuation-guidance-frequently-asked-questions.shtml.
Song, C.J., Thomas, W.B., Yi, H., 2010. Value relevance of FAS No. 157 fair value hierarchy information and the impact of corporate governance mechanisms. The Accounting Review 85 (4), 1375–1410.
TRACE, 2018. TRACE Monthly volume report for 2017. https://www.finra.org/industry/trace-monthly-volume-report-2017.
Wooldridge, J.M. 2002. Econometric Analysis of Cross Section and Panel Data. Cambridge, MA: MIT Press.

Appendix B: Variable Definitions

Appendix B describes the variables used in this study. We use NAIC filing database from 2014-2017. Credit ratings are hand-collected from Weiss and A.M. Best ratings website.

Variable	Description
Security-Insurer-year Characteristics	
FV Difference$_{i,j,t}$	The difference in the fair value estimate of security j by firm i at year t and the mode value of the same security at year t. It is calculated as fair value/par value of security j of firm i minus the mode value of fair value/par value of security j across all firms in year t, multiplied by 100.
Positive FV Difference$_{i,j,t}$	Positive value of *FV Difference*
Negative FV Difference$_{i,j,t}$	Negative value of *FV Difference*
Δ*FV Difference*$_{i,j,t}$	The change in *FV Difference* of security j of firm i from year t-1 to year t.
Pricing switch$_{i,j,t}$	Indicator variable that equals one if the estimation source of security j in period t is different from that in period t-1 for firm i, zero otherwise.
Upward Switch$_{i,j,t}$	Indicator variable that equals one if the estimation source of security j in period t is different from that in period t-1 for firm i and Δ*FV Difference*$_{i,j,t}$ >0, zero otherwise.
Downward Switch$_{i,j,t}$	Indicator variable that equals one if the estimation source of security j in period t is different from that in period t-1 for firm i and Δ*FV Difference*$_{i,j,t}$ <0, zero otherwise.
Level 2$_{i,j,t}$	Indicator variable equal to one if the security j of firm i is designated as level 2 asset in year t, zero otherwise.
Level 3$_{i,j,t}$	Indicator variable that equals one if the security j of firm i is designated as level 3 asset in year t, zero otherwise.
Inflation $_{i,j,t-1}$	Indicator variable that equals one if *FV Difference*$_{i,j,t}$ >0, zero otherwise.
Discount $_{i,j,t-1}$	Indicator variable that equals one if *FV Difference*$_{i,j,t}$ < 0, zero otherwise.
On Target$_{i,j,t-1}$	Indicator variable that equals one if *FV Difference*$_{i,j,t}$ = 0, zero otherwise.
Materiality$_{i,j,t}$	Fair value of security j divided by the total fair value of securities of firm i in year t-1.
Selfest$_{i,j,t}$	Indicator variable that equals one if a security j is self-estimated by firm i in period t, zero otherwise.
HImp$_{i,j,t}$	Indicator variable that equals one if the fair value of security j is less than its carrying value in period t, zero otherwise.
Impairment$_{i,j,[t,t+1]}$	Indicator variable that equals one if an impairment is recognized for security j by firm i during period t to t+1, zero otherwise.
Impairment Amount$_{i,j,[t,t+1]}$	The amount of impairment recognized for security j by firm i during period t to t+1 deflated by its par value in year t times by 100.
Security-Year Characteristics	
Δ*Moderate*$_{j,t}$	The change in *Moderate*$_{j,t}$, where *Moderate*$_{j,t}$ is the mode value of fair value / par value of security j across all firms in year t, multiplied by 100.
#Holders$_{j,t}$	The number of insurers holding security j in year t.
#Pricing Source$_{j,t}$	The number of pricing source for security j across all firms in year t.
Spread$_{j,t}$	The difference between maximum value and minimum value of security j across firms in year t.
Insurer-year Characteristics	
ROA$_{i,t}$	Return on assets calculated as net income divided by total assets in year t.
RBC$_{i,t}$	Risk based capital ratio calculated as total adjusted capital divided by total risk-based capital for firm i in year t.
Asset$_{i,t}$	The logarithm of total assets of firm i in year t.
Leverage$_{i,t}$	Total liabilities divided by total assets.
Liquidity$_{i,t}$	Liquidity ratio calculated as cash plus cash equivalents divided by total assets, multiplied by 100.
% Carried FV$_{i,t-1}$	The ratio of assets that may be required to be carried at FV (SVO designation of 6) to fixed income assets. For the denominator, the value of fixed income securities with SVO designation of 1-5 (6) is calculated based on the carrying value (fair value).

Large$_{i,t-1}$	Indicator variable equal to one if an insurer is in the top quartile of total assets for the sample, zero otherwise.
Low RBC$_{i,t}$	Indicator variable that equals one if firm i has RBC ratio that is in the lowest quartile, zero otherwise.
External Advisor$_{i,t}$	Indicator variable that equals one if the firm i has engaged at least one external investment advisor, investment manager, or broker/dealer in investment management, zero otherwise.
Financial Examination$_{i,t}$	Indicator variable that equals one if firm i has been investigated by the regulator in the year t, zero otherwise.
Big 4$_{i,t}$	Indicator variable that equals one if the firm i is audited by a Big 4 audit firm in period t, zero otherwise.
Log(Total Fees)$_{i,t}$	Logarithm of firm i's total audit fees in year t.
Best Rating$_{i,t+1}$	Credit rating provided by A.M. rating agency at period t+1.
Weiss Rating$_{i,t+1}$	Credit rating provided by Weiss rating agency at period t+1.
Sum_up$_{i,t}$	The sum of the value of firm i's fixed income securities with an upward switch scaled by firm i's total assets. The value of securities with SVO designation of 1-5 (6) is calculated based on the carrying value (fair value).
Sum_down$_{i,t}$	The sum of the value of firm i's fixed income securities with a downward switch scaled by firm i's total assets. The value of securities with SVO designation of 1-5 (6) is calculated based on the carrying value (fair value).
Sum_noswitch$_{i,t}$	The sum of the value of firm i's fixed income securities that are not self-estimated and do not have a change in pricing source from year t-1 to t scaled by firm i's total assets. The value of securities with SVO designation of 1-5 (6) is calculated based on the carrying value (fair value).
Log(Other assets$_{i,t}$)	Logarithm of total assets minus the value of fixed income securities. The value of securities with SVO designation of 1-5 (6) is calculated based on the carrying value (fair value).
Stock$_{i,t}$	Indicator variable that equals one if the firm is a stock company, zero otherwise.
Log(Premium income)$_{i,t}$	The logarithm of Premium income of firm i in year t. Premium income is based on premiums from annuities, life insurance, and accident and health insurance business.
Noncore$_{i,t}$	Indicator variable that equals one if the more than 50% of the Premium income is from businesses other than main (life insurance) business, zero otherwise.
# Subsidiaries$_{i,t}$	The number of subsidiaries of firm i in year t.
Public$_{i,t}$	Indicator variable that equals one if the upstream direct parent of the firm is a public company, zero otherwise.
Noncore$_{i,t}$	Indicator variable that equals one if more than 50 percent of a Life insurers' business is generated outside the core business (life insurance and annuity contracts), zero otherwise.
Sum_up (down)_inf$_{i,t}$	The sum of the value of prior inflated fixed income securities (i.e., *FV Difference* $_{i,j,t-1}$>0) that are switched upward (downward) scaled by the firm's total assets in year t. The value of securities with SVO designation of 1-5 (6) is calculated based on the carrying value (fair value).
Sum_up (down)_dis$_{i,t}$	The sum of the value of prior discounted fixed income securities (i.e., *FV Difference* $_{i,j,t-1}$<0) that are switched upward (downward) scaled by the firm's total assets in year t. The value of securities with SVO designation of 1-5 (6) is calculated based on the carrying value (fair value).
Sum_up (down)_ont$_{i,t}$	The sum of the value of prior on-target fixed income securities (i.e., *FV Difference* $_{i,j,t-1}$=0) that are switched upward (downward) scaled by the firm's total assets in year t. The value of securities with SVO designation of 1-5 (6) is calculated based on the carrying value (fair value).
Sum_noswitch_inf$_{i,t}$	The sum of the value of prior inflated fixed income securities (i.e., *FV Difference* $_{i,j,t-1}$>0) that are not self-estimated and not switched scaled by the firm's total assets in year t. The value of securities with SVO designation of 1-5 (6) is calculated based on the carrying value (fair value).

Sum_noswitch_dis $_{i,t}$	The sum of the value of prior discounted fixed income securities (i.e., *FV Difference* $_{i,j,t-1}$<0) that are not self-estimated and not switched scaled by the firm's total assets in year t. The value of securities with SVO designation of 1-5 (6) is calculated based on the carrying value (fair value).
Sum_noswitch_ont $_{i,t}$	The sum of the value of prior on-target fixed income securities (i.e., *FV Difference* $_{i,j,t-1}$=0) that are not self-estimated and not switched scaled by the firm's total assets in year t. The value of securities with SVO designation of 1-5 (6) is calculated based on the carrying value (fair value).
Log(Sum_up) $_{i,t}$	Logarithm of the sum of the value of firm i's fixed income securities with an upward switch. The value of securities with SVO designation of 1-5 (6) is calculated based on the carrying value (fair value).
Log(Sum_down) $_{i,t}$	Logarithm of the sum of the value of firm i's fixed income securities with a downward switch. The value of securities with SVO designation of 1-5 (6) is calculated based on the carrying value (fair value).
Log(Sum_noswitch) $_{i,t}$	Logarithm of the sum of the value of firm i's fixed income securities that are not self-estimated and do not have a change in pricing source from year t-1 to t. The value of securities with SVO designation of 1-5 (6) is calculated based on the carrying value (fair value).

Table 1: Firm and Security Characteristics

Table 1 Panel A provides descriptive statistics for variables used in main analyses. Panels B provides the frequency distribution on the use of external pricing sources by insurers. Panel C provides the Top 5 pricing services used by insurers. Panel D provides the Top 5 pricing services before and after the pricing switch for the subsample with a switch of pricing services. The Appendix B provides variable definitions

Panel A: Descriptive Statistics

	N	Mean	p25	p50	p75	Sd.
Security-Insurer-year Characteristics						
FV Difference $_{i,j,t}$	631,928	0.029	0.000	0.000	0.000	0.696
Δ*FV Difference* $_{i,j,t}$	631,928	-0.016	0.000	0.000	0.000	1.510
Positive FV Difference $_{i,j,t}$	631,928	0.136	0.000	0.000	0.000	0.546
Negative FV Difference $_{i,j,t}$	631,928	-0.107	0.000	0.000	0.000	0.397
Positive FV Difference $_{i,j,t}$	115,959	0.739	0.080	0.260	0.860	1.087
Negative FV Difference $_{i,j,t}$	127,662	-0.53	-0.620	-0.200	-0.070	0.745
Pricing Switch $_{i,j,t}$	631,928	0.124	0.000	0.000	0.000	0.329
Upward Switch $_{i,j,t}$	631,928	0.037	0.000	0.000	0.000	0.188
Downward Switch $_{i,j,t}$	631,928	0.035	0.000	0.000	0.000	0.185
Level 2 $_{i,j,t-1}$	631,928	0.948	1.000	1.000	1.000	0.221
Level 3 $_{i,j,t-1}$	631,928	0.026	0.000	0.000	0.000	0.160
Inflation $_{i,j,t-1}$	631,928	0.186	0.000	0.000	0.000	0.389
Discount $_{i,j,t-1}$	631,928	0.185	0.000	0.000	0.000	0.389
Materiality $_{i,j,t-1}$	631,928	0.001	0.000	0.000	0.001	0.002
HImpi $_{i,j,t-1}$	631,928	0.288	0.000	0.000	1.000	0.453
Selfest $_{i,j,t}$	631,928	0.073	0.000	0.000	0.000	0.260
Impairment $_{i,j,[t,t+1]}$	335,110	0.006	0.000	0.000	0.000	0.077
Impairment Amount $_{i,j,[t,t+1]}$	335,110	0.096	0.000	0.000	0.000	2.198
Impairment Amount $_{i,j,[t,t+1]}$	2,012	16.283	1.098	6.282	23.193	23.126
Security-Year Characteristics						
Spread $_{j,t-1}$	49,624	0.022	0.003	0.008	0.020	0.046
#Holders $_{j,t}$	49,624	17.33	7.000	13.000	24.000	13.229
#Pricing Source $_{j,t}$	49,624	6.874	3.000	5.000	9.000	4.596
Δ*Moderate* $_{j,t}$	49,624	0.072	-2.280	0.000	2.200	6.911
U.S. Gov $_{j,t}$	49,624	0.029	0.000	0.000	0.000	0.167
RMBS $_{j,t}$	49,624	0.061	0.000	0.000	0.000	0.240
CMBS $_{j,t}$	49,624	0.068	0.000	0.000	0.000	0.251
ABS $_{j,t}$	49,624	0.114	0.000	0.000	0.000	0.318
Sovereign $_{j,t}$	49,624	0.028	0.000	0.000	0.000	0.165
Municipal $_{j,t}$	49,624	0.039	0.000	0.000	0.000	0.193
GSE $_{j,t}$	49,624	0.074	0.000	0.000	0.000	0.262

Corp.$_{j,t}$	49,624	0.587	0.000	1.000	1.000	0.492
Insurer-year Characteristics						
Financial Examination $_{i,t}$	1,866	0.104	0.000	0.000	0.000	0.305
Big 4$_{i,t}$	1,866	0.648	0.000	1.000	1.000	0.478
External Advisor$_{i,t}$	1,866	0.861	1.000	1.000	1.000	0.346
ROA$_{i,t}$	1,866	0.031	0.019	0.032	0.042	0.015
RBC$_{i,t}$	1,866	16.033	7.309	10.077	16.091	15.340
Asset$_{i,t}$	1,866	19.946	17.529	19.737	21.905	2.654
Leverage$_{i,t}$	1,866	1.042	0.987	1.027	1.076	0.119
Liquid$_{i,t}$	1,866	4.152	0.329	1.455	5.003	6.006
% Carried FV$_{i,t-1}$	1,866	0.002	0.000	0.000	0.000	0.014
Public$_{i,t-1}$	1,866	0.077	0.000	0.000	0.000	0.267
Large$_{i,t-1}$	1,866	0.034	0.000	0.000	0.000	0.181
Log(Total Fees)$_{i,t}$	1,854	11.988	11.143	12.387	13.785	3.195
Sum_up$_{i,t}$	1,854	0.032	0.000	0.000	0.011	0.093
Sum_down$_{i,t}$	1,854	0.035	0.000	0.000	0.013	0.101
Sum_noswitch$_{i,t}$	1,854	0.36	0.099	0.368	0.588	0.263
Stock$_{i,t}$	1,854	0.944	1.000	1.000	1.000	0.229
# Subsidiaries$_{i,t}$	1,854	8.215	0.000	0.000	2.000	43.972
Sum_up_inf$_{i,t}$	1,854	0.006	0.000	0.000	0.001	0.029
Sum_up_dis$_{i,t}$	1,854	0.006	0.000	0.000	0.000	0.034
Sum_up_ont$_{i,t}$	1,854	0.019	0.000	0.000	0.005	0.064
Sum_down_inf$_{i,t}$	1,854	0.007	0.000	0.000	0.001	0.030
Sum_down_dis$_{i,t}$	1,854	0.005	0.000	0.000	0.000	0.024
Sum_down_ont$_{i,t}$	1,854	0.023	0.000	0.000	0.005	0.077
Sum_noswitch_inf$_{i,t}$	1,854	0.071	0.006	0.033	0.085	0.102
Sum_noswitch_dis$_{i,t}$	1,854	0.044	0.000	0.009	0.041	0.083
Sum_noswitch_ont$_{i,t}$	1,854	0.245	0.048	0.174	0.412	0.225
Weiss Rating$_{i,t}$	1,756	10.513	9.000	11.000	12.000	2.631
Log(Other Assets) $_{i,t}$	1,756	19.548	17.442	19.423	21.564	2.790
Log(Premium income)$_{i,t}$	1,756	18.522	16.752	19.529	23.457	9.090
Noncore$_{i,t}$	1,756	0.283	0.000	0.000	1.000	0.451
Log(Sum_up)$_{i,t}$	1,756	8.508	0.000	11.466	16.588	8.541
Log(Sum_down)$_{i,t}$	1,756	8.732	0.000	12.213	16.553	8.497
Log(Sum_noswitch)$_{i,t}$	1,756	17.933	16.028	18.715	21.053	4.832
Best Rating$_{i,t}$	1,239	10.387	10.000	11.000	12.000	1.577

Panel B: Frequency Distribution of Pricing Sources

Total sample	N=631,928			
Pricing Service	Stock Exchange	Brokers/Custodian	Securities Valuations Office	Self-Estimation
82%	0%	10%	0%	7%
Switched Sample	N=78,095			
Before Switch				
Pricing Service	Stock Exchange	Brokers/Custodian	Securities Valuations Office	
83%	0%	16%	1%	
After Switch				
Pricing Service	Stock Exchange	Brokers/Custodian	Securities Valuations Office	
89%	0%	11%	0%	

Panel C: Top 5 Pricing Services Used by Insurers

ICE	47%
Reuters	8%
Barclays	5%
Bloomberg	4%
HUB	3%

Panel D: Top 5 Pricing Services before and after the Pricing Switch within the Subsample with a Pricing Service Switch

Before Switch	**%**	**After Switch**	**%**
ICE	40%	ICE	37%
Barclays	9%	Bloomberg	15%
S&P	7%	S&P	5%
Fides Capital	6%	Reuters	5%
HUB	4%	Fides Capital	4%

Table 2: Opportunism or Better Reporting behind Pricing Switch

Table 2 Panel A (B) tabulates the percentage of security-insurer-year (insurer-year) observations with upward switch and downward switch in year t categorized by their classification in year t-1. Panel C provides the OLS regression results on the determinants of the pricing switch decision. *Pricing Switch*$_{i,j,t}$ is the indicator variable that equals one if the estimation source of security j in period t is different from that in period t-1 for firm i, zero otherwise. *Upward Switch*$_{i,j,t}$ (*Downward Switch*$_{i,j,t}$) equals one if the estimation source of security j in period t is different from that in period t-1 for firm i and Δ*FV Difference*$_{i,j,t}$ >0 (Δ*FV Difference*$_{i,j,t}$ <0). We report t-statistics in parentheses. ***, **, * indicate two–tailed significance at 1%, 5%, and 10%, respectively. The Appendix B provides variable definitions.

Panel A: The Percentage of Security-insurer-years with Upward (Downward) Switch

Switched Samples	*Upward Switch*$_{i,j,t}$	*Downward Switch*$_{i,j,t}$
Inflation$_{i,j,t-1}$=1 (N=117,652)	0.4%	1.9%
Discount $_{i,j,t-1}$=1 (N=117,220)	2.3%	0.3%
On target$_{,j,t-1}$=1 (N=397,056)	1.0%	1.3%

Panel B: The Percentage of Insurer-years with Upward (Downward) Switch

Switched Samples	*Upward Switch*$_{i,j,t}$	*Downward Switch*$_{i,j,t}$
Insurer-years with *Inflation* $_{i,t-1}$=1 (N=1,529)	15.9%	33.8%
Insurer-years with Discount$_{i,t-1}$=1 (N=1,445)	33.3%	15.0%
Insurer-years with On target $_{i,t-1}$=1 (N=1,778)	24.4%	22.5%

Panel C: The Determinant of Pricing Switch

Dep. Var.=	(1) *Pricing Switch*$_{i,j,t}$	(2) *Upward Switch*$_{i,j,t}$	(3) *Downward Switch*$_{i,j,t}$	(4) *Upward Switch*$_{i,j,t}$	(5) *Downward Switch*$_{i,j,t}$	(6) *Upward Switch*$_{i,j,t}$	(7) *Downward Switch*$_{i,j,t}$
Inflation$_{i,j,t-1}$	0.021***	0.002***	0.084***	0.006***	0.085***	0.003***	0.084***
	(17.91)	(3.20)	(111.67)	(4.04)	(59.64)	(3.35)	(101.22)
Discount$_{i,j,t-1}$	0.032***	0.111***	-0.014***	0.126***	-0.014***	0.108***	-0.012***
	(28.02)	(152.30)	(-19.05)	(90.33)	(-10.16)	(132.70)	(-14.63)
Spread$_{j,t-1}$	0.055***	-0.006	0.010	-0.006	0.010	-0.006	0.010
	(4.15)	(-0.70)	(1.15)	(-0.72)	(1.15)	(-0.75)	(1.20)
Materiality$_{i,j,t-1}$	-0.188	0.427***	-0.047	0.421**	-0.046	0.423***	-0.045
	(-0.68)	(2.46)	(-0.27)	(2.42)	(-0.26)	(2.44)	(-0.26)
ROA$_{i,t-1}$	0.428***	-0.120*	0.211***	-0.112*	0.212***	-0.122*	0.212***
	(3.91)	(-1.74)	(3.03)	(-1.63)	(3.04)	(-1.76)	(3.05)
RBC$_{i,t-1}$	-0.007***	-0.003***	-0.000	-0.003***	-0.000	-0.003***	-0.000
	(-28.54)	(-20.59)	(-0.15)	(-18.26)	(-0.04)	(-20.59)	(-0.12)
HImp$_{i,j,t-1}$	-0.003***	0.001*	-0.002***	0.001*	-0.002***	-0.000	-0.000
	(-3.23)	(1.79)	(-2.76)	(1.79)	(-2.77)	(-0.11)	(-0.22)
Δ*Moderate*$_{j,t}$	-0.001***	-0.000***	-0.000**	-0.000***	-0.000**	-0.000***	-0.000**
	(-9.94)	(-10.00)	(-1.99)	(-10.01)	(-2.00)	(-9.91)	(-2.04)
% Carried FV$_{i,t-1}$	13.062***	6.701***	5.176***	6.736***	5.175***	6.699***	5.173***
	(31.72)	(25.82)	(19.77)	(25.96)	(19.77)	(25.82)	(19.76)
Public$_{i,t-1}$	-0.081***	0.013***	-0.006***	0.013***	-0.006***	0.013***	-0.006***
	(-21.58)	(5.45)	(-2.48)	(5.57)	(-2.47)	(5.41)	(-2.44)
Large$_{i,t-1}$	-0.185***	-0.084***	-0.083***	-0.084***	-0.083***	-0.084***	-0.083***
	(-23.54)	(-17.05)	(-16.54)	(-17.04)	(-16.54)	(-17.04)	(-16.56)

$Inflation_{i,t-1}$ $*RBC_{i,t-1}$				-0.000***	-0.000		
				(-2.82)	(-0.92)		
$Discount_{i,t-1}*RBC_{i,t-1}$				-0.001***	0.000		
				(-12.85)	(0.28)		
$Inflation_{i,t-1}*$ $HImp_{i,j,t-1}$						-0.002	-0.002*
						(-1.21)	(-1.80)
$Discount_{,t-1}*$ $HImp_{i,j,t-1}$						0.008***	-0.007***
						(6.25)	(-5.10)
Observations	631928	631928	631928	631928	631928	631928	631928
R-squared	0.342	0.197	0.155	0.197	0.155	0.197	0.156
Security FE	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES	YES
Test of coefficient equality				$\chi2$ (p-value)			
Coefficient for *Discount* in upward switch model = Coefficient for *Inflation* in downward switch model		312.43 (<0.001)		219.90 (<0.001)		171.98 (<0.001)	
Coefficient for *Inflation* in upward switch model = Coefficient for *Discount* in downward switch model		513.30 (<0.001)		9.56 (0.002)		272.77 (<0.001)	

Table 3: The Effect of Pricing Switch on the Quality of Fair Value Estimation

Table 3 provides OLS regression results of the effect of pricing switch on the quality of fair value estimation measured by *FV Difference*. In Panel A, the dependent variable is *FV Difference$_{i,j,t}$*, which is fair value/par value of security j of firm i minus the mode value of fair value/par value of security j across all firms in year t, multiplied by 100. Panel B reports the same regression as in Column (1) of Pane A after including the main effects and the interaction terms of the five cross-sectional variables: *Low RBC, Himp, Financial Examination, Big 4,* and *External Advisor*. *Low RBC* equals 1 if RBC ratio belongs to the lowest quartile group, zero otherwise. We report t-statistics in parentheses. ***, **, * indicate two-tailed significance at 1%, 5%, and 10%, respectively. The Appendix B provides variable definitions of all other variables.

Panel A: The Effect of Pricing Switch on *FV Difference$_{i,j,t}$*

Dep. Var.=	(1) FV Difference	(2) FV Difference	(3) FV Difference	(4) FV Difference	(5) FV Difference
Level Hierarchy	All	All	Level 1	Level 2	Level 3
Inflation$_{i,j,t-1}$	0.163***	0.147***	-0.065***	0.099***	0.521***
	(61.11)	(52.98)	(-3.04)	(36.94)	(13.22)
Discount$_{i,j,t-1}$	-0.115***	-0.089***	0.105***	-0.076***	-0.220***
	(-43.60)	(-32.51)	(4.54)	(-28.71)	(-5.13)
Upward Switch$_{i,j,t}$	0.368***				
	(79.68)				
Downward Switch$_{i,j,t}$	-0.313***				
	(-68.38)				
*Upward Switch$_{i,j,t}$ * Inflation$_{i,j,t-1}$*		0.668***	0.608***	0.532***	1.298***
		(52.48)	(7.72)	(42.29)	(12.39)
*Upward Switch$_{i,j,t}$ * Discount$_{i,j,t-1}$*		0.216***	0.094**	0.192***	0.668***
		(36.87)	(2.25)	(34.23)	(7.95)
*Upward Switch$_{i,j,t}$ * Ontarget$_{i,j,t-1}$*		0.544***	0.420***	0.523***	1.149***
		(65.50)	(7.39)	(66.63)	(7.12)
*Downward Switch$_{i,j,t}$ * Inflation$_{i,j,t-1}$*		-0.176***	-0.100**	-0.171***	-0.161**
		(-28.72)	(-2.33)	(-28.85)	(-2.23)
*Downward Switch$_{i,j,t}$ * Discount$_{i,j,t-1}$*		-0.654***	-0.724***	-0.592***	-1.428***
		(-44.86)	(-5.40)	(-42.27)	(-9.84)
*Downward Switch$_{i,j,t}$ * Ontarget$_{i,j,t-1}$*		-0.423***	-0.539***	-0.412***	-1.284***
		(-58.26)	(-9.57)	(-60.29)	(-8.98)
Level 2$_{i,j,t-1}$	-0.002	0.002			
	(-0.22)	(0.23)			
Level 3$_{i,j,t-1}$	-0.202***	-0.203***			
	(-16.04)	(-16.18)			
ROA$_{i,t}$	-0.857***	-0.399	0.647	-0.730***	-5.062
	(-3.14)	(-1.47)	(0.36)	(-2.82)	(-1.26)
RBC$_{i,t}$	-0.002***	-0.002***	-0.007***	-0.002***	0.005
	(-3.20)	(-3.22)	(-2.61)	(-3.61)	(0.69)
Asset$_{i,t}$	-0.056***	-0.057***	-0.083	-0.056***	-0.760***
	(-5.25)	(-5.35)	(-1.30)	(-5.51)	(-3.14)
Leverage$_{i,t}$	-0.085***	-0.088***	0.200*	-0.091***	-0.311
	(-4.68)	(-4.83)	(1.66)	(-5.34)	(-0.96)
Liquidity$_{i,t}$	-0.002***	-0.002***	0.003	-0.002***	0.003
	(-2.74)	(-3.49)	(1.03)	(-3.84)	(0.28)
Moderate$_{j,t}$	-0.011***	-0.011***	-0.009***	-0.009***	-0.086***
	(-57.15)	(-57.08)	(-7.73)	(-51.81)	(-29.70)

Selfest$_{i,j,t}$	0.296***	0.295***	-0.270***	0.394***	-0.059
	(50.20)	(50.15)	(-2.83)	(59.99)	(-1.27)
Observations	631928	631928	15075	599248	15883
R-squared	0.265	0.268	0.323	0.282	0.464
Security FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES
Test of coefficient equality	F-statistics (p value)				
|*Inflation*|=|*Discount*|	115.55	151.36	0.95	27.07	16.84
	(<0.001)	(<0.001)	(0.329)	(<0.001)	(<0.001)
| *Upward Switch*| = | *Downward Switch*|	62.00				
	(<0.001)				
|*Upward Switch* Discount*| =		20.43	0.01	5.93	16.84
|*Downward Switch* Inflation*|		(<0.001)	(0.922)	(0.014)	(<0.001)
|*Discount+Upward Switch* Discount*|		121.24	0.28	26.95	0.94
=|*Inflation+Downward Switch* Inflation*|		(<0.001)	(0.599)	(<0.001)	(0.333)

Panel B: The Effect of Pricing Switch on *FV Difference*$_{i,j,t}$ – Cross Sectional Analyses

Dep. Var.=	(1) FV Difference	(2) FV Difference	(3) FV Difference	(4) FV Difference	(5) FV Difference
CS variable=	*Low RBC*	*HImp*	*Financial Examination*	*Big 4*	*External Advisor*
Inflation$_{i,j,t-1}$	0.163***	0.159***	0.163***	0.163***	0.163***
	(61.21)	(59.74)	(61.10)	(61.20)	(61.23)
Discount$_{i,j,t-1}$	-0.114***	-0.113***	-0.115***	-0.114***	-0.115***
	(-43.38)	(-42.95)	(-43.59)	(-43.51)	(-43.78)
Upward Switch$_{i,j,t}$	0.349***	0.361***	0.367***	0.413***	0.407***
	(61.34)	(66.66)	(75.07)	(43.21)	(28.62)
Downward Switch$_{i,j,t}$	-0.317***	-0.320***	-0.314***	-0.315***	-0.265***
	(-56.60)	(-60.66)	(-64.26)	(-33.28)	(-18.38)
Upward Switch$_{i,j,t}$ * *CS*	0.055***	0.025***	0.010	-0.059***	-0.044***
	(5.94)	(2.79)	(0.78)	(-5.50)	(-2.93)
Downward Switch$_{i,j,t}$ * *CS*	0.014	0.023***	0.004	0.004	-0.054***
	(1.47)	(2.52)	(0.31)	(0.35)	(-3.57)
CS	0.003	-0.087***	-0.003	-0.028***	0.059***
	(0.71)	(-35.76)	(-1.12)	(-3.50)	(13.76)
Level 2$_{i,j,t-1}$	-0.001	-0.002	-0.002	-0.005	-0.002
	(-0.13)	(-0.22)	(-0.21)	(-0.44)	(-0.15)
Level 3$_{i,j,t-1}$	-0.201***	-0.204***	-0.202***	-0.204***	-0.201***
	(-15.97)	(-16.17)	(-16.03)	(-16.21)	(-15.91)
ROA$_{i,t}$	-0.947***	-0.797***	-0.834***	-0.950***	-0.817***
	(-3.46)	(-2.92)	(-3.04)	(-3.46)	(-3.00)
RBC$_{i,t}$		-0.002***	-0.002***	-0.002***	-0.002***
		(-3.12)	(-3.21)	(-3.16)	(-3.48)
Asset$_{i,t}$	-0.056***	-0.054***	-0.057***	-0.058***	-0.050***
	(-5.24)	(-5.06)	(-5.28)	(-5.43)	(-4.60)
Leverage$_{i,t}$	-0.079***	-0.084***	-0.083***	-0.089***	-0.081***
	(-4.33)	(-4.61)	(-4.54)	(-4.84)	(-4.47)
Liquidity$_{i,t}$	-0.002***	-0.001**	-0.002***	-0.002***	-0.001**
	(-3.05)	(-2.42)	(-2.77)	(-2.87)	(-2.28)
Moderate $_{j,t}$	-0.011***	-0.011***	-0.011***	-0.011***	-0.011***
	(-57.19)	(-55.23)	(-57.16)	(-57.22)	(-57.53)
Selfest$_{i,j,t}$	0.296***	0.297***	0.296***	0.296***	0.294***
	(50.18)	(50.48)	(50.17)	(50.24)	(49.87)
Observations	631928	631928	631928	631928	631928
R-squared	0.265	0.266	0.265	0.265	0.265
Security FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES

Table 4: The Effect of Pricing Switch on Future Impairment

Table 4 Panel A and B report regression results on the consequences of pricing switch on future impairment likelihood and magnitude, using *Impairment*$_{[t,t+1]}$ and *Impairment Amount*$_{[t,t+1]}$ as the dependent variable, respectively. *Impairment*$_{i,j,[t,t+1]}$ is an indicator variable that equals one if there is an impairment charge for the security during period t to t+1, and zero otherwise. *Impairment Amount*$_{i,j,[t,t+1]}$ is 100 times the amount of impairment charge for the security during period t and t+1 deflated by the par value of the security at period t, we set this variable to zero for securities without an impairment charge. We report *t*-statistics in parentheses. ***, **, * indicate two-tailed significance at 1%, 5%, and 10%, respectively. The Appendix B provides variable definitions.

Panel A: The Effect of Pricing Switch on the Probability of Impairment During year t and t+1

	(1)	(2)	(3)	(4)	(5)	(6)
	Logit	OLS	OLS	Logit	OLS	OLS
Dep. Var.=	*Impairment*	*Impairment*	*Impairment*	*Impairment*	*Impairment*	*Impairment*
Upward Switch$_{i,j,t}$	-0.557***	-0.004***	-0.007***	-0.154	-0.002	-0.005***
	(-3.54)	(-4.46)	(-7.54)	(-0.79)	(-1.62)	(-4.96)
Downward Switch$_{i,j,t}$	-0.112	-0.001	-0.009***	-0.068	-0.001	-0.009***
	(-0.87)	(-1.03)	(-9.97)	(-0.39)	(-0.95)	(-8.71)
Upward Switch$_{i,j,t}$ * *HImp*$_{i,j,t-1}$				-0.887***	-0.007***	-0.005***
				(-2.77)	(-3.68)	(-2.63)
Downward Switch$_{i,j,t}$ * *HImp*$_{i,j,t-1}$				-0.101	0.000	0.000
				(-0.40)	(0.14)	(0.19)
HImp$_{i,j,t-1}$	1.000***	0.007***	0.007***	1.022***	0.007***	0.007***
	(21.06)	(21.68)	(22.27)	(20.99)	(21.64)	(22.03)
Level 2$_{i,j,t-1}$	0.725***	0.003***	0.000	0.730***	0.003***	0.000
	(3.00)	(3.36)	(0.24)	(3.02)	(3.37)	(0.24)
Level 3$_{i,j,t-1}$	1.634***	0.011***	0.012***	1.641***	0.011***	0.012***
	(6.31)	(9.39)	(6.77)	(6.33)	(9.41)	(6.78)
ROA$_{i,t}$	22.978***	0.255***	-0.010	23.029***	0.255***	-0.009
	(32.34)	(35.22)	(-0.52)	(32.38)	(35.27)	(-0.45)
RBC$_{i,t}$	-0.097***	-0.000***	0.001***	-0.096***	-0.000***	0.001***
	(-12.39)	(-12.00)	(4.78)	(-12.30)	(-11.98)	(4.78)
Asset$_{i,t}$	0.192***	0.001***	-0.001	0.192***	0.001***	-0.001
	(14.79)	(11.04)	(-0.36)	(14.83)	(11.09)	(-0.39)
Leverage$_{i,t}$	-0.647**	-0.003	0.006	-0.657**	-0.003*	0.005
	(-2.15)	(-1.58)	(1.26)	(-2.19)	(-1.64)	(1.20)
Liquidity$_{i,t}$	0.046***	0.000***	-0.001***	0.049***	0.000***	-0.001***
	(4.84)	(3.83)	(-5.95)	(5.09)	(4.00)	(-5.91)
# holders$_{j,t}$	-0.021***	-0.000***	-0.000***	-0.021***	-0.000***	-0.000***
	(-12.29)	(-12.67)	(-11.47)	(-12.27)	(-12.67)	(-11.47)
Selfest$_{i,j,t}$	-0.956***	-0.005***	-0.013***	-0.955***	-0.005***	-0.013***
	(-8.81)	(-9.71)	(-21.71)	(-8.80)	(-9.71)	(-21.70)
Observations	335110	335110	335090	335110	335110	335090
(Pseudo) R-squared	0.094	0.008	0.046	0.094	0.008	0.046
Year FE	YES	YES	YES	YES	YES	YES
Firm FE	NO	NO	YES	NO	NO	YES
Security FE	NO	NO	NO	NO	NO	NO
Test of coefficients					F-statistics (p-value)	
*HImp + Upward Switch*HImp=0*				0.18	0.05	1.91
				(0.670)	(0.828)	(0.166)

Marginal Effect				
Upward switch	-0.556		-0.153	
*Upward switch*HImp*			-0.887	

Panel B: The Effect of Pricing Switch on the Amount of Impairment during year t and t+1

	(1)	(2)	(3)	(4)
	OLS	OLS	OLS	OLS
Dep. Var.=	Impairment Amount	Impairment Amount	Impairment Amount	Impairment Amount
Sample	Whole sample	Whole sample	Whole sample	Whole sample
Upward Switch$_{i,j,t}$	-0.072***	-0.140***	-0.037	-0.111***
	(-3.01)	(-5.32)	(-1.28)	(-3.58)
Downward Switch$_{i,j,t}$	-0.034	-0.151***	-0.021	-0.138***
	(-1.51)	(-6.00)	(-0.78)	(-4.76)
Upward Switch$_{i,j,t}$ * *HImp*$_{i,j,t-1}$			-0.109**	-0.087*
			(-2.17)	(-1.71)
Downward Switch$_{i,j,t}$ * *HImp*$_{i,j,t-1}$			-0.047	-0.043
			(-0.95)	(-0.85)
HImp$_{i,j,t-1}$	0.201***	0.203***	0.206***	0.207***
	(22.81)	(22.71)	(22.66)	(22.48)
Level 2$_{i,j,t-1}$	0.110***	0.102**	0.110***	0.102**
	(4.48)	(2.30)	(4.49)	(2.30)
Level 3$_{i,j,t-1}$	0.255***	0.283***	0.256***	0.283***
	(7.53)	(5.55)	(7.55)	(5.56)
ROA$_{i,t}$	2.768***	0.389	2.775***	0.420
	(13.42)	(0.71)	(13.45)	(0.77)
RBC$_{i,t}$	-0.004***	-0.000	-0.004***	-0.000
	(-6.51)	(-0.14)	(-6.50)	(-0.13)
Asset$_{i,t}$	-0.002	-0.253***	-0.002	-0.256***
	(-0.95)	(-2.80)	(-0.93)	(-2.83)
Leverage$_{i,t}$	0.053	-0.096	0.050	-0.104
	(1.04)	(-0.75)	(0.99)	(-0.81)
Liquidity$_{i,t}$	-0.002	-0.017***	-0.002	-0.017***
	(-1.13)	(-3.07)	(-1.00)	(-3.04)
# of Securities$_{j,t}$	-0.002***	-0.002***	-0.002***	-0.002***
	(-9.00)	(-8.19)	(-9.00)	(-8.18)
Selfest$_{i,j,t}$	-0.027*	-0.104***	-0.027*	-0.104***
	(-1.85)	(-6.01)	(-1.85)	(-6.00)
Observations	335110	335090	335110	335090
R-squared	0.003	0.010	0.003	0.010
Year FE	YES	YES	YES	YES
Firm FE	NO	YES	NO	YES
Security FE	NO	NO	NO	NO
Test of coefficients			F-statistics (p-value)	
*HImp + Upward Switch*HImp=0*			3.78 (0.052)	5.74 (0.016)

Table 5: Audit Pricing

Table 5 provides the association between audit fees and pricing source switch. Column (1) reports OLS regression results on the association between the logarithm of total audit fees and proportion of securities with an upward switch (*Sum_up*), a downward switch (*Sum_down*), and no switch (*Sum_noswitch*) during the current year. Column (2) reports the results of the same regressions as that in Column (1), but further condition the pricing switch based on prior FV estimate bias categorized as inflation (*_inf*), discount (*_dis*), and on-target (*_ont*). We report *t*-statistics in the parentheses. ***, **, * indicate two-tailed significance at 1%, 5%, and 10%, respectively. The Appendix B provides variable definitions.

	(1)	(2)
Dep. Var.=	Total Audit Fees	Total Audit Fees
$Sum\_up_{i,t}$	4.695***	
	(2.64)	
$Sum\_down_{i,t}$	0.699	
	(0.43)	
$Sum\_noswitch_{i,t}$	2.034**	
	(2.18)	
$Sum\_up\_inf_{i,t}$		7.813**
		(2.16)
$Sum\_up\_dis_{i,t}$		-0.001
		(-0.00)
$Sum\_up\_ont_{i,t}$		5.550**
		(2.39)
$Sum\_down\_inf_{i,t}$		6.954
		(0.96)
$Sum\_down\_dis_{i,t}$		-6.664
		(-0.73)
$Sum\_down\_ont_{i,t}$		0.194
		(0.10)
$Sum\_noswitch\_inf_{i,t}$		3.433**
		(2.03)
$Sum\_noswitch\_dis_{i,t}$		-1.183
		(-0.53)
$Sum\_noswitch\_ont_{i,t}$		2.232**
		(2.13)
$Log\ (Other\ Assets)_{i,t}$	0.542***	0.547***
	(6.01)	(5.97)
$Big\ 4_{i,t}$	-0.705	-0.711
	(-1.46)	(-1.46)
$ROA_{i,t}$	-22.184	-21.862
	(-1.41)	(-1.38)
$Stock_{i,t}$	-2.814***	-2.788***
	(-4.66)	(-4.67)
$\#\ Subsidiaries_{i,t}$	0.003	0.003
	(0.90)	(0.84)
$Public_{i,t}$	0.706	0.815
	(0.95)	(1.09)
$Leverage_{i,t}$	-1.507	-1.465
	(-1.10)	(-1.08)
Observations	1854	1854
R-squared	0.082	0.083
Year FE	YES	YES

Table 6: The Effects of Pricing Switch on Credit Rating

Table 6 provides the regression results on the association between credit rating and pricing switch. Columns (1) and (2) report OLS regression results using the next-period credit ratings provided by Weiss rating & AM Best agency, respectively. We report *t*-statistics in the parentheses. ***, **, * indicate two-tailed significance at 1%, 5%, and 10%, respectively. The Appendix B provides variable definitions.

Dependent Variable =	(1) Weiss Rating	(2) Best Rating
$Log(Sum\_up)_{i,t}$	-0.021*	-0.011
	(-1.86)	(-1.47)
$Log(Sum\_down)_{i,t}$	-0.000	-0.003
	(-0.05)	(-0.43)
$Log(Sum\_noswitch)_{i,t}$	0.048***	0.048***
	(3.21)	(4.12)
$Log(Other\ Assets)_{i,t}$	0.235***	0.209***
	(7.35)	(9.33)
$Big\ 4_{i,t}$	1.236***	1.085***
	(9.25)	(11.65)
$\#\ Subsidiaries_{i,t}$	0.001	0.001
	(0.81)	(1.61)
$ROA_{i,t}$	24.114***	0.364
	(6.00)	(0.13)
$RBC_{i,t}$	0.060***	0.021***
	(13.08)	(6.08)
$Leverage_{i,t}$	0.831*	0.775**
	(1.74)	(2.32)
$Stock_{i,t}$	-0.776***	0.211
	(-3.20)	(1.44)
$Log(Premium\ income)_{i,t}$	0.037***	0.007
	(5.55)	(1.61)
$Noncore_{i,t}$	0.519***	-0.098
	(4.09)	(-1.10)
$Public_{i,t}$	-0.289	0.369***
	(-1.39)	(2.72)
Observations	1756	1239
R-squared	0.257	0.342
Year FE	YES	YES

Tests of Coefficients	F-statistics (p-value)	
Log(Other assets) = Log(Sum_up)	51.17 (<0.001)	79.09 (<0.001)
Log(Other assets) = Log(Sum_down)	44.71 (<0.001)	75.83 (<0.001)
Log(Other assets) = Log(Sum_nonswitch)	20.35 (<0.001)	29.00 (<0.001)
Log(Sum_down) = Log(Sum_up)	0.97 (0.325)	0.33 (0.566)
Log(Sum_nonswitch) = Log(Sum_up)	14.71 (<0.001)	19.37 (<0.001)
Log(Sum_down) = Log(Sum_nonswitch)	7.50 (0.006)	14.62 (<0.001)