Hiding behind Writing: Communication in Offering Process and MBS Performance

Harold H. Zhang Feng Zhao Xiaofei Zhao*

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Abstract

Securities Offering Reform (SOR) in 2005 formalized free writing prospectus (FWP) as permittable written communication in the offering process by securities issuers. Using non-agency mortgage deals securitized following SOR, we find the surprising result that MBS deals with more usage of FWPs sufferred up to 20% higher cumulative net loss. Using textual analysis as an identification strategy, we attribute our finding to the more aggressive sales tactic associated with more FWP usage being employed for deals with more adverse information withholding. Consequently, the cumulative net loss on these deals are worse than their reported characteristics. Lending support to this explanation, we find that the FWP effect persists even after controlling for deal initial yield spreads and credit enhancements, and higher usage of FWPs are associated with increased content ambiguity in the final prospectus. The latter is a tactic often used to hedge litigation risk on undisclosed information.

Keywords: Written Communication, Free Writing Prospectus, Information withholding, Uncertain Text, MBS Performance

*We thank Zhonglan Dai, Jun Li, Tim Loughran, and Han Xia for helpful comments. All three authors are from Naveen Jindal School of Management, University of Texas at Dallas, 800 West Campbell Road, Richardson, Texas, 75080, email: harold.zhang@utdallas.edu, feng.zhao@utdallas.edu, xiaofei.zhao@utdallas.edu

"In many ways, mortgage products such as RMBS were ground zero in the financial crisis. Misrepresentations in connection with the creation and sale of mortgage securities contributed greatly to the tremendous losses suffered by investors once the U.S. housing market collapsed."

Robert Khuzami, Director of the SEC Enforcement Division and Co-chair of the President's Financial Fraud Enforcement Task Force RMBS Working Group

1. Introduction

It is widely believed that the crash in the market for securitized subprime residential mortgages played a critical role in the most recent financial crisis. A large number of studies have devoted to the analysis of subprime mortgage securitization. In particular, researchers have increasingly focused on the organization and process of mortgage securitization to seek explanation for the dramatic surge in securitized loan losses.[1] An important distinguishing feature of mortgage-backed securities (MBS), more broadly asset-backed securities (ABS) market is the offering process that differs from other assets such as equity. In conjunction with widely use of shelf-registration, issuers/underwriters of MBS often use term sheets, which are formally referred to as free writing prospectus after the Securities Offering Reform in December 2005, for public offering of these securities.

Our study provides the first empirical investigation into how communication in the offering process of MBS relates to the quality of these securities. In contrast to oral communications used in MBS offering process such as sales by telephone calls, a free writing prospectus, according to the Securities Exchange Commission, is "a written communication that constitutes an offer to sell or a solicitation of an offer to buy securities that are or will be the subject of a registration statement." We uncover that more written communications in the form of free writing prospectus (FWP) are associated with economically and statistical-

[1] A few notable examples include Mian and Sufi (2009); Nadauld and Sherlund (2009); Nadauld and Sherlund (2009); Keys, Mukherjee, Seru, and Vig (2010); Keys, Seru, and Vig (2012); Purnanandam (2011); Jiang, Nelson, and Vytlacil (2014), among others.

ly significant larger deal cumulative net loss, after controlling for an extensive list of deal characteristics, macroeconomic conditions, and the underwriter and issuing year fixed effect. This relation remains strong even after controlling for the deal initial yield spreads and credit enhancements.

There is increasing anecdotal evidence that larger mortgage deal losses are related to information withholding including misrepresentations and omissons in connection with the creation and sale of mortgage securities. For instance, in a press release by the Department of Justice dated November 20, 2012, "Residential Mortgage-Backed Securities (RMBS) Working Group Co-Chair New York Attorney General Eric T. Schneiderman today filed a Martin Act complaint against Credit Suisse Securities (USA) LLC and its affiliates for making fraudulent misrepresentations and omissions to promote the sale of RMBS to investors." Similar press releases have also reported complaints on all major RMBS issuers including JP Morgan Chase, CITI Group, Morgan Stanley, Bank of America, among others.[2] In an effort to investigate those responsible for misconduct contributing to the financial crisis through the pooling and sale of RMBS, President Obama created RMBS Working Group early 2012, a joint federal and state initiative. However, detecting this type of misconduct is extremely challenging. In the speech announcing the RMBS Working Group, the Co-Chair of the Working Group and SEC Enforcement Division Director Robert Khuzami stated that "We already have issued scores of supoenas, anlyzed more than approximately 25 million pages of documents, dozens and dozens of witnesses, and worked with our industry experts to analyze the terms of these deals and the accuracy of the disclosures made to investors. We are looking for evidence that a firm failed to disclose important information when selling these securities — for example, misleading disclosures about the credit quality, conformity with underwriting guidelines, underlying property valuations, and delinquency and defects of mortgages in the RMBS pools."

[2]See Appendix A for more detailed descriptions on an incomplete list of the SEC charged cases.

Given the importance of this issue, a large-scale empirical investigation with direct evidence of informtion withholding by MBS issuers would be ideal. However, it is almost impossible to accomplish this given the availability of existing data. We therefore investigate the use of written communication in MBS sales process — a measure of aggressive sales tactic and relate the FWP usage to the quality of these MBS securities. An important identification strategy that we employ to establish a link between adverse information withholding by MBS issuers/underwriters and FWP usage is the textual analysis of financial documents proposed by Loughran and McDonald (2011, 2013, and 2014). Using this most recent methodology, we explore how written communications in ABS sales process are related to the content of the final deal prospectus. We find that, FWP usage contributes significantly to the textual uncertainty of the final prospectus, a tactic often used to create contingencies to hedge risks on undisclosed information as documented in a number of recent studies in corporate settings (such as, Rogers, Van Buskirk, and Zechman (2011), among others). We interpret these findings as indicating that MBS issuers/underwriters withheld adverse information on collateral assets while using FWPs as a more aggressive sales tactic in the MBS offering process.

In practice, as a prudent rule of thumb, legal counsels of ABS issuers/underwriters often recommend oral over written communication in the offering process because the latter constitutes higher potential litigation risk and expected legal costs (see Arnholz and Gainor (2011)). However, written communication is more effective in promoting ABS sales than oral communication because written offers provide better protection to ABS investors. Thus, written offers in the form of FWPs represent a more aggressive sales tactic by issuers/underwriters in the ABS offering process. ABS issuers/underwriters would sell more aggressively those deals that are more likely to underperform. To the extent that reported deal characteristics represent the essential information revealed to ABS investors, the underperformance of these deals after controlling for the reported deal characteristics suggests that issuers/underwriters

withheld adverse information. Consequently, ceteris paribus, issuers/underwriters use more FWPs to aggressively promote sales of ABS and withhold adverse information on these deals to derive financial benefits.

We test the hypothesis using residential mortgage-backed security deals that went through public offering process in 2006 to 2007, two-years immediately following the FWPs were formally used in ABS offering after the enactment of the Securities Offering Reform (SOR) in December 2005. Concurrently, Regulation AB, the first regulation enacted specifically for asset-backed securities in January 2006, explicitly states that written communication in the ABS offering process is subject to the rules under SOR. We stop at the end of 2007 because the residential MBS market dropped precipitously as the financial crisis began unfolding. We collect the number of FWPs filed prior to the offering date for each MBS deal securitized in the two-year period. Our data indicates that more than half MBS deals had at least one FWP with a quarter of MBS deals having three or more FWPs. Figure 1 shows that, on average, deals with multiple FWPs had a much larger cumulative net loss, measured as the sum of all losses of principal suffered until December 2010 divided by the total original balance of all mortgages, than deals with zero or one FWP on average in this time period. Controlling for an extensive list of variables that could potentially influence MBS performance, we find that the cumulative net loss increases by 1.2% for a one-standard deviation increase in the number of FWPs. This accounts for 10% of the average cumulative net loss for the MBS deals during this period. Further, for deals with multiple FWPs, the cumulative net loss is even higher by 2.4% which accounts for almost 20% of the average cumulative net loss. Our findings thus support the hypothesis that issuers/underwriters withheld adverse information while using FWPs to aggressively promote MBS sales. This is consistent with the growing litigation cases in which some issuers/underwriters withheld various forms of adverse information in certain securitized residential mortgage deals.

Figure 1 about here

We conduct two additional analyses to demonstrate that our finding of the FWP usage on deal cumulative net loss of securitized mortgages is consistent with issuers/underwriters withholding adverse information on deal quality. In our first analysis, we control for yield spreads and credit enhancements on these deals. If MBS issuers/underwriters disclosed all information on these mortgage deals, investors would have taken the information into account in the pricing and credit enhancement of these deals. In this case, FWP usage should have little or substantially reduced incremental relation with the cumulative net loss of these mortgage deals after we include the deal initial yields and credit enhancement in our regression analysis. Nonetheless, our empirical analysis including deal yield spreads and credit enhancements does not eliminate the positive relation between the cumulative net loss and FWP usage on these deals (which remains very strong), after controlling for the extensive list of deal charateristics, macroeconomic conditions, and the underwriter fixed effect.

Our second analysis draws from the recent literature on textual analysis and examines the effects of FWPs on the uncertain text of the final deal prospectus. Studies on textual analysis suggests that complexity is primarily used to make the information that issuers/underwriters disclose more murky and the uncertain text is used to create contingencies to hedge litigation risk on information not disclosed. Thus, FWP usage should be more closely related to the uncertain text than the complexity of the final prospectus. Consistent with this argument, we find that more FWP usage increases the uncertain text of the final deal prospectus of the issuing securities but has a much weaker relation to the prospectus complexity. To the extent that FWP usage is related to adverse information withholding, it should capture some effect associated with the uncertain text of the final prospectus. Indeed, we find that the relation between deal cumulative net loss and the uncertain text in deal final prospectus decreases substantially when we include the use of FWPs in the regression analysis. In the meantime, the relation between deal cumulative net loss and the prospectus complexity does not change

with the inclusion of FWP usage. Our evidence suggests that MBS issuers/underwriters use the uncertain text in deal final prospectus to hedge the litigation risk associated with information not disclosed in written communication in MBS offering process.

Our study is related to several strands of existing literature. First, it is related to the literature on communication and information release, in particular, the emerging literature on using textual analysis to understand written communication. While early studies argue that firms disclose bad news to avoid lawsuits in the future (Skinner (1994)), more recent evidence suggests that firms disclosing more also have more frequent litigation (Skinner (1997)), and firms withhold bad news up to certain threshold (Kothari, Shu, and Wysocki (2009)). Recent studies on corporate securities offering and financial information disclosure show that managers utilize linguistic complexity and tone of disclosure to mitigate the impact of adverse information release and litigation risk.[3] Our study indicates that MBS issuers/underwriters have used more uncertain text in the final prospectus to create contingencies to hedge risks on adverse information not disclosed when they use FWPs to aggressively promote sales of lower quality mortgage deals.

Second, it is related to studies on the relation between loan performance and organizational structure of securitization market as well as different roles of various participants and their influences on MBS performances. For example, Demiroglu and James (2012) document that an originator's loss exposure to mortgage deals leads to more screening and better loan performance. Benmelech, Dlugosz, and Ivashina (2012) investigate the effect of securitization on collateralized loan obligations (CLO). Agarwal and Ben-David (2014) present evidence that the change of loan officers' compensation structure from fixed salary to volume-based pay increases aggressiveness of higher risky loan origination. Similar results are also docu-

[3]On linguistic complexity, see for examples, Li (2008), Bloomfield (2008), You and Zhang (2009), Miller (2010), Lehavy, Li, and Merkley (2012), Dougal, Engelberg, Garca, and Parsons (2012), Lawrence (2013), De Franco, Hope, Vyas, and Zhou (2013), Loughran and McDonald (2014). In the context of managing litigation risk in corporate written disclosure, see for examples, Mohan (2006), Nelson and Pritchard (2007), Rogers, Van Buskirk, and Zechman (2011), and Hanley and Hoberg (2012).

mented in Tzioumis and Gee (2013). Arentsen, Mauer, Rosenlund, Zhang, and Zhao (2014) demonstrate that credit default swaps encourage the origination of riskier subprime loans and contribute to the mortgage default crisis. Dai, Zhang, and Zhao (2014) show that mortgage deal sponsor and underwriter affilication leads to a worse loan performance due to adverse selection. We uncover that use of written communication by MBS issuers/underwriters in the form of FWPs to investors are closely related to the quality of mortgage deals issued by these securitizers.

The paper is organized as follows. Section 2 discusses written communication in the form of FWPs in ABS offering process and develop our hypothesis. Section 3 discusses our data and reports summary statistics. In Section 4, we present empirical analysis results and provide discussions on the relation between FWP usage and mortgage deal cumulative net loss. In particular, we investigate the relation between deal cumulative net loss and FWP usage after controlling for initial yields and credit enhancement of mortgage deals, and further explore how more FWPs are related to higher uncertain text usage in the deal final prospectus. Finally, we offer concluding remarks in Section 5.

2. Communication in ABS Offering Process and Hypothesis Development

There are several distinguishing features between asset-backed securities and other fixed-income securities or equity. As noted by the SEC, ABS investors are generally interested in the characteristics and quality of the underlying assets, the standards for their servicing, the timing and receipt of cash flows from those assets and the structure for distribution of those cash flows. As a general matter, there is essentially no business or management (and therefore no managements discussion and analysis of financial performance and condition) of the issuing entity, which is designed to be a solely passive entity. Information regarding

characteristics and quality of the assets is important for investors in assessing how a pool will perform. Information relating to the quality of servicing of the underlying assets also is relevant to assessing how the asset pool is expected to perform and the reliability of the allocation and distribution functions.

Consequently, while the offering process for asset-backed securities (including MBS) shares some feastures of that for equity or other fixed income securities, it also differs from the offering process for other fixed income securities and equity in important ways. The most distinguishing feature for the ABS is reliance on shelf-registration and the use of term sheets in the offering process which fall into three categories:

1. "structural term sheets," which provide factual information regarding the financial terms of an asset-backed securities transaction, including the securities to be offered and the structure of the offering;

2. "collateral term sheets," which provide data about the assets underlying the offering; and

3. "series term sheets," which combine aspects of a structural term sheet with a collateral term sheet.

In the mid 1990s, SEC no-action letters have permitted issuers/underwriters to use term sheets for public offering of asset-backed securities.[4] An issuer providing a potential investor with a term sheet that has not been accompanied or preceded by a final prospectus must, under specified circumstances, file the material contained in the term sheet with the SEC. The circumstances in which filing is required will vary depending on the type of term sheet. Securities Offering Reform enacted in December 2005 further clarified and formalized the

[4]In the SEC letters, "computational material" is another term used to describe both structural term sheets and collateral term sheets. Decrement tables, which contain maturity projections such as are commonly found in mortgage-backed and complex owner trust transactions, would appear to be series term sheets because they describe proposed structures for the offered securities but are based on data concerning the collateral pool.

use of written communication, known as a free writing prospectus, other than statutory prospectus in the public offering of ABS. SEC defines a free writing prospectus as "a written communication that constitutes an offer to sell or a solicitation of an offer to buy securities that are or will be the subject of a registration statement and is not:

- a prospectus satisfying the requirements of Securities Act Section 10(a);
- a prospectus satisfying our rules permitting the use of preliminary or summary prospectuses or prospectuses subject to completion;
- a communication made in reliance on the special rules for asset-backed issuers permitting the use of ABS informational and computational materials; or
- a prospectus because a final prospectus meeting the requirements of Section 10(a) was sent or given with or prior to the written communication."

According to SOR, a FWP can be used by a well-known seasoned issuer within 30 days prior to filing the registration statement, and further, can be used by any other eligible issuer or offering participant after a registration statement has been filed. The adopted rules permit written offers, including electronic communications, outside the statutory prospectus beyond those currently permitted by the Securities Act, if certain conditions are met. The use of FWP has substantially relaxed the restrictions on communications regarding written communications during the offering process.

However, in practice, a sizable portion of ABS issuers/underwriters did not use FWPs. More important, legal counsels of ABS issuers/underwriters often recommend that they refrain from using FWPs to communicate to investors and prefer oral communication to the extent possible. For instance, in the manual on the offering of asset-backed securities, issuers/underwriters are explicitly instructed as follows:"*When feasible, issuers and underwriters should structure offering communications in a form that does not subject a seller to*

potential liability under section 12(a)(2) of the Securities Act and/or is not required to be filed as a free writing prospectus...it is advisable to do so rather than to disseminate similar information in the form of a free writing prospectus..." (see page 2-91 of Arnholz and Gainor (2011)). This is primarily motivated by concerns for potential legal consequences of written communications such as FWPs. Thus, from the perspective of issuers and underwriters, filing more FWPs entails higher litigation risk and expected legal cost.

Therefore, relative to oral communication, written communication in the form of FWPs represents a more aggressive sales tactic in the ABS offering process and is likely associated with higher litigation risk for ABS issuers/underwriters. Intuitively, eveything else equal, ABS issuers/underwriters may use more aggressive sales tactics to promote lower quality deals to investors than higher quality deals. This suggests that FWP usage in the offering process may be closely related to the quality of the ABS deal being securitized. When FWP usage increases litigation risk and associated legal cost, to profit from the public offering of ABS, issuers/underwriters have to recope the expected legal cost from offering these securities. Since deal characteristics represent the essential information for ABS investors to value securities, one way of extracting additional benefit from offering these securities is to withhold adverse information which would otherwise reduce the sales prices of the securities.[5] Consequently, ceteris paribus, issuers/underwriters who use more FWPs to aggressively promote sales of ABS are also likely to withhold more adverse information on these deals. Our discussions suggest the following testable hypothesis on the relation between mortgage deals and written communications in the form of FWPs in MBS public offering process.

[5]There is ample anecdotal evidence in the aftermath of the recent financial crisis that some issuers/underwriters withheld adverse information on the underlying pool assets. For example, in a recent case SEC charged three Morgan Stanley entities with misleading investors in two residential mortgage-backed securities (RMBS) that the firms underwrote, sponsored, and issued. According to the chief of the SEC Enforcement Division's Complex Financial Instruments Unit, Michael Osnato, "Morgan Stanley understated the number of delinquent loans behind these securitizations during a critical juncture of the financial crisis and denied investors the *full extent of the facts* necessary to make informed investment decisions." Source: `http://www.sec.gov/News/PressRelease/Detail/PressRelease/1370542355594#.VEpQyPnF-jY`.

Hypothesis: Ceteris paribus, more FWP usage in the MBS offering process is associated with worse mortgage deal performance because of the close relation between the aggressive sales tactic of FWPs and adverse information withholding.

3. Data and Summary Statistics

Our data primarily comes from two sources, Bloomberg and the Electronic Data Gathering, Analysis, and Retrieval (EDGAR) system of the SEC. We link deals from Bloomberg to EDGAR by matching deal name. For each deal from Bloomberg, we compare its name with the ABS names in EDGAR.[6] If multiple matches are found, we then read the final prospectuses filed with the SEC to pin down the correct match. To test our hypotheses on the relation between securitized mortgage deal performance and the use of FWPs in MBS public offering process, we collect data on securitized residential mortgage deals for 2006 and 2007. We focus on this time period because SOR was enacted in December 2005 which clarified the content, permissible use, and potential liability of written communications in ABS public offering using FWPs, and the drastic housing market decline leading to a precipitous drop in the number of securitized mortgage deals post 2007 delineates the end point of our sample.[7]

For each residential mortgage deal, we collect deal-level performance and characteristics information from Bloomberg. These include cumulative net loss, original collateral balance, the number of tranches, the percentage of loans with low documentation, the average FICO score, the loan-to-value (LTV) ratio at 75 percentile, the percentage of adjustable rate mortgages, negative amortization, purchase loans, single family property, owner-occupied house, and second lien. We gather information on FWPs from EDGAR on SEC filings of mortgage deals. These include the number of FWPs filed and the deal final prospectus. For our regression analysis on mortgage deal performance, we also control for regional and

[6]SEC has a directory for all types of ABS filers (over 10,000 with SIC code 6189).

[7]From the top graph of Figure 1, we can see that the number of deals already reaches a low level starting from August 2007 (below 40), and by December 2007, the number of deal drops below 10.

macroeconomic variables such as the housing price change, the credit spread, and 10-year treasury yield.

In addition, linguistic complexity and use of uncertain text can be two different approaches used by ABS issuers/underwriters to their benefits. In particular, while linguistic complexity is used to make disclosed information murky, ABS issuers/underwriters may use content ambiguity in their final issuing prospectus to create contingencies to aid adverse information withholding. Thus, we also obtain information on deal linguistic complexity and uncertain text from the final prospectus. This is accomplished by counting the total number of words in each final prospectus and the percentage of uncertain words using the uncertain word list compiled by Loughran and McDonald (2011) and the aggregation method suggested by Loughran and McDonald (2013). As an alternative, we also use the total number of pages of the final prospectus as an alternative for the total number of words to measure complexity.[8]

Table 1 reports the summary statistics of key variables for mortgage deals. For our sample, the cumulative net loss is 12% of the initial collateral balance per deal on average with a standard deviation of 8.6%. The average number of FWPs per deal is 1.6 with a standard deviation of 1.8. About half of mortgage deals had zero or one FWP. At the same time, there are 25% deals with three or more FWPs. The final prospectus supplement has about 52 thousand words and 118 pages on average with 2.8% uncertain words. The average document length of the MBS final prospectus supplement is close to that of the equity IPO final prospectus (53 thousand words) according to Loughran and McDonald (2013). Our uncertain words are based on the aggregate list of *uncertain*, *weak modal*, *negative* word

[8]We follow the procedure as in Loughran and McDonald (2011, 2013) to parse the individual documents. We add one additional step in the parsing procedure to separate the final prospectus supplement from the general shelf-registration statement. This is because the final prospectus in general include both parts and only the supplement is prepared for a specific deal. The total number of words and percent of uncertain words are based on the supplement. The style and format of the final prospectuses vary across deals and some deals are submitted to SEC in XML format. We exclude those deals with unorganized format when we use total number of words and percent of uncertain words in the analysis. We also extract the table of content from each final prospectus supplement and obtain the total number of pages accordingly.

lists (Loughran and McDonald (2011)). Among the 2600 Loughran and McDonald (2011) aggregate uncertain words, two words alone account for 24.7% of the uncertain words used in the MBS final prospectus supplements: the word *may* accounts for 18.6% and the word *approximately* accounts for 6.1%.[9] The original collateral balance is about $870 million on average with a standard deviation of $520 million. The mortgage deals had about 22 tranches on average per deal. More than 60% loans in mortgage deals had low documentation on average.

Table 1 about here

Table 2 shows the correlation matrix between deal cumulative net loss and deal characteristics. For the key variables of interests, we find that both the number of FWPs and the dummy variable of multiple FWPs are highly positively correlated with deal cumulative net loss. In the meantime, both measures of FWP usage are positively correlated to the measures of complexity (total number of words and total number of pages) and the percentage of uncertain words of the final prospectus supplement. The complexity measures and the percentage of uncertain words of the final prospectus supplement are also significantly positively correlated with deal cumulative net loss.

Table 2 about here

4. Empirical Analysis and Discussions

We next conduct empirical analysis to test our hypothesis and provide discussions on our findings. We first examine what determines the usage of FWPs. We then perform extensive regression analysis on the relation between mortgage deal performance and the use of FWPs. Finally, we conduct additional analyses to provide evidence on the use of FWPs for adverse information withholding.

[9]We carefully exclude the cases in which "May" is used to refer to the calendar month. To do so, we identify and exclude the instances for "20XX May" and "May 20XX".

4.1 Determinants of FWP Usage

We begin with the question on what determines issuers' choice of using FWPs in their MBS public offering.

$$\text{FWP Usage} = f(\text{Deal characteristic variables} + \text{Fixed effects}),$$

where we use both number of FWPs and the choice of multiple FWPs for securitized mortgage deals as alternative measures for FWP Usage. When we use the number of FWPs (multiple FWPs), we use the Poisson (logistic) regression to perform the analysis. We include an extensive list of key mortgage deal characteristics as well as issuance year and lead underwriter fixed effects. The results are reported in Table 3.

Table 3 about here

We find that the deals with higher usage of FWPs tend to have larger size and lower average FICO scores. These characteristics likely make the offering process more difficult and therefore necessary to engage in aggressive promotion tactics using FWPs. We also find that more reputable issuers use more FWPs. This is consistent with more reputable issuers being able to derive more benefit from using FWPs as they are more credible to investors. The number of tranches is negatively related to the use of FWPs. To the extent that the number of tranches represent the complexity of structured products, this suggests that MBS issuers/underwriters may use product complexity as a substitute for the use of FWPs to withhold adverse information in achieving better sales.

4.2 Mortgage Deal Performance and FWP Usage

We now investigate the effect of frequent FWPs on mortgage deal performance. We use the cumulative net loss of a mortgage deal as the measure for securitized loan performance. Specifically, our deal level performance measure is the cumulative net loss rate measured as

the sum of all losses of principal suffered until December 2010 divided by the total original balance of all mortgages. We conduct the following OLS regressions:

$$\text{Cumulative net loss} = \alpha + \beta \times \text{FWP Usage} + \text{Deal characteristic variables} + \text{Fixed effects}.$$

Table 4 reports the results for the FWP effect on mortgage deal cumulative net loss. We find that both the number of FWPs and the multiplicity of FWP have a significant positive effect on the cumulative net loss. Controlling for mortgage deal characteristics, regional and macroeconomic variables, the deal cumulative net loss is higher by about 1.2% for a one-standard deviation increase in the use of FWPs (0.67×1.82). This accounts for 10% of the average mortgage deal cumulative net loss. For mortgage deals with multiple FWPs (two and above), the cumulative net loss is higher by 2.4% and accounts for 20% of the average deal cumulative net loss. Our evidence supports the hypothesis that more FWP usage is associated with worse mortgage deal performance.

Table 4 about here

Turning to other control variables, we find that the number of tranches increases the cumulative net loss. To the extent that the number of tranches of mortgage deal proximates product complexity of securitization, this finding suggests that product complexity adversely affects mortgage deal performance. This lends support to the finding in Celerier and Vallee (2013). Analyzing 55,000 retail structured financial products issued in European financial markets, they document that the more complex a retail structured financial product is, the more profitable it is for the issuer, which translates into relatively low performance for more complex products. Further, consistent with our intuition, high FICO score has a negative effect on the cumulative net loss while high LTV has a positive effect on the cumulative net loss. The former reflects higher borrower credit worthiness and thus better loan quality. The latter indicates higher default risk because borrowers are more leveraged. On the other hand, while original collateral balance and high underwriter reputation had positive effect

on how frequent the issuers/underwriters used FWPs, they had no significant effect on the cumulative net loss of mortgage deals, possibly due to the lead underwriter fixed effect on deal performance. In all regression specifications, house price change has a negative effect on the cumulative net loss, suggesting that housing price decline contributed to the large loss of MBS.

4.3 Analyses on Adverse Information Withholding of Securitizers

We conduct two additional analyses to demonstrate that our finding of the FWP usage on securitized mortgage deal performance is attributed to issuers/underwriters withholding adverse information on collateral assets. Our first analysis examines the effects of FWPs on deal performance while controlling for yield spread and credit enhancement on these deals. In our second analysis, we investigate the effects of FWPs on the linguistic complexity and the uncertain text usage of the final deal prospectus as well as the effect of FWPs on deal performance in the presence of prospectus complexity and uncertain text usage.

4.3.1 Yields, Credit Enhancement and FWP Effect on Deal Performance

Intuitively, the adverse information associated with more FWP usage would not be fully reflected in credit enhancement and pricing of mortgage deals if there is information withholding. This implies that the use of FWPs will have incremental effect on deal performance even after we control for deal yields and credit enhancement. To explore this point, we include mortgage deal pricing and credit enhancement measure for each deal in our specification and check if the FWP effect remains significant. For mortgage deal pricing, following the convention in the literature, we use the initial average yield spread of all securities issued by the trust of mortgage deals. This is the difference between the average yield of all securities issued by the trust weighted by the face value of the securities and the yield on the 10-year Treasury bond. The former is calculated using the standards of the Bond Market Association and reported by Bloomberg.

We use two measures for credit enhancement: subordination and over-collateralization. The former measures the percentage of securities issued in a deal that are not rated AAA. The latter is defined as the balance of underlying mortgages exceeding the face value of issued securities. We perform the following regression analysis:

$$\begin{aligned}\text{Cumulative net loss} &= \alpha + \beta \times \text{FWP Usage} + \beta_1 \times \text{Yield spreads} \\ &\quad + \beta_2 \times \text{Credit enhancements} + \text{Deal charact.} + \text{Fixed effects.}\end{aligned}$$

Table 5 reports the results of our analysis. We find both the number of FWPs and the multiplicity of FWPs remain positive and statistically significant, albeit the magnitude of the FWP effect is reduced. This indicates that more FWP usage is associated with incremental deal cumulative net loss. Our finding suggests that the use of FWPs is not fully reflected in the credit enhancement and pricing of mortgage deals. This lends support to adverse information withholding in the use of FWPs in the MBS offering process.

Table 5 about here

4.3.2 FWP Effect on Prospectus Content and Deal Performance

Linguistic complexity has been studied in the context of corporate financial disclosures.[10] One of the main insights from this line of research is summarized as follows. When corporate managers want to release certain adverse information, they tend to use more complex language or try to bury it in longer documents. On the other hand, if corporate managers want to reduce the litigation risk of not releasing (and withholding) certain adverse information, they may dampen the tone of what they are releasing by creating more contingencies and using more uncertain words.[11] In the case of MBS issuance, complexity is primarily used to

[10] See for examples, Li (2008), Bloomfield (2008), You and Zhang (2009), Miller (2010), Lehavy, Li, and Merkley (2012), Dougal, Engelberg, Garca, and Parsons (2012), Lawrence (2013), De Franco, Hope, Vyas, and Zhou (2013), Loughran and McDonald (2014).

[11] In the context of managing litigation risk in corporate written disclosure, see for examples, Mohan (2006), Nelson and Pritchard (2007), Rogers, Van Buskirk, and Zechman (2011), and Hanley and Hoberg (2012).

make the information that issuers/underwriters disclose more murky. The content ambiguity is used to create contingencies to hedge the risk on the information that issuers/underwriters are not disclosing. Thus, higher FWP usage is more closely related to the content ambiguity than the complexity of the final deal prospectus. We first test this effect of FWPs on the complexity and the percentage of uncertain word usage in the final prospectus supplement and then examine its implication for the mortgage deal performance.

Following Loughran and McDonald (2013) and Loughran and McDonald (2014), we use the total number of words in the final prospectus supplement as a proxy for linguistic complexity and the percentage of uncertain words as a proxy for the level of uncertain text.[12] We also use the total number of pages of the final prospectus supplement as in Ghent, Torous, and Valkanov (2014) as an alternative measure of prospectus complexity. For both measures of the prospectus complexity, we jointly consider the linguistic complexity and the content uncertainty when we investigate their effects on mortgage deal performance.

To investigate the effect of FWP usage on the content of final prospectus, we run the following OLS regressions:

$$\begin{aligned} \text{Prospectus complexity} &= \alpha_c + \beta_c \times \text{FWP Usage} + \text{Deal characteristics} + \text{Fixed effects}, \\ \text{Prospectus uncertainty} &= \alpha_u + \beta_u \times \text{FWP Usage} + \text{Deal characteristics} + \text{Fixed effects}. \end{aligned}$$

Table 6 reports the regression results of the total number of words — a prospectus complexity measure, the percentage of uncertain words, and total number of pages — an alternative measure of prospectus complexity, on the use of FWPs. Our results indicate that the percentage of uncertain words used in the final prospectus supplement is positively related

[12]As discussed earlier, we need to separate the final prospectus supplement from the general shelf-registration statement in the final prospectus, therefore the raw file size of the final prospectus is not a proper measure for the supplement alone. We use the total number of words of the supplement instead. Loughran and McDonald (2014) show that the total number of words is highly correlated with file size for 10-K filings.

to more FWP usage measured by both the number of FWPs and the multiplicity dummy variable. Given that uncertain text of the prospectus is a tactic used by issuers to hedge litigation risk on the information that they are not disclosing, we have evidence that MBS issuers/underwriters used FWPs to aggressively promote MBS sales and hedged litigation risk on adverse information withheld by increasing uncertain text usage in the final deal prospectus. In the meantime, the prospectus complexity measured by the total number of words in the final prospectus supplement is only weakly related to the FWP usage and is not significantly related to the multiplicity dummy variable of FWPs. There is no significant relation between the total number of pages in the final prospectus supplement and the FWP usage. These findings suggest that FWP usage is closely related to the uncertain text used in the final deal prospectus supplement.

Table 6 about here

To the extent that uncertain text in deal final prospectus is used to hedge litigation risk on adverse information withheld, its effect on mortgage deal cumulative net loss will be attentuated when we include FWP usage in the regression because FWP usage serves as a direct proxy for the aggressive sales tactic used by issuers. In contrast, the impact of the prospectus complexity on deal performance may not change with the inclusion of FWP usage.

Table 7 reports the regression results of deal cumulative net loss on the content ambiguity and the complexity of the final prospectus supplement while also including the use of FWPs. In all specifications for our analysis, both the number of FWPs and the multiplicity of FWPs are positive and highly significant. The estimated coefficient of the uncertain text is attenuated as predicted. Both the economic magnitude and statistical significance are reduced substantially when we include FWP variables in the regressions. For example, the estimated coefficient of the uncertain text is dramatically reduced by 31 to 37 percent. Meanwhile,

the estimated coefficients of linguistic complexity are not affected much by the inclusion of FWP variables. These findings provide supporting evidence that MBS issuers/underwriters may have withheld adverse information and used uncertain text in the final deal prospectus to hedge litigation risk on adverse information withholding.

Table 7 about here

One concern is that adverse information withheld associated with aggressive sales tactic of FWPs is entirely attributed to the linguistic complexity and content ambiguity of the final prospectus. To mitigate this concern, we include both yield spreads and credit enhancement while also controlling for the final prospectus complexity and uncertain text use. Table 8 reports the regression results. In all our specifications, both measures of FWP usage are significantly positively related to the deal cumulative net loss. Compared with the results in Table 5, the adverse information withholding associated with the aggressive sales tactic of FWPs remains strong and only slightly attentuated in magnitude. This lends further support to MBS issuers/underwriters withheld adverse information while using more aggressive sales tactic of FWPs in the MBS offering process.

Table 8 about here

4.4 Robustness Checks — Matching Sample Analysis

Our regression results above show that more FWP usage is associated with larger mortgage deal cumulative net loss after controlling for an extensive list of variables that may potentially influence deal performance. Nonetheless, it is possible that the estimated relation between deal cumulative net loss and FWP usage may reflect the differences in the characteristics of mortgage deals with different levels of FWPs. In other words, the uncovered relation between cumulative net loss and FWP usage may be due to misspecification in the relation between the cumulative net loss and mortgage deal characteristics so that mortgage deals with large cumulative net loss were disproportionally high in the use of FWPs. To mitigate

this concern, we use matching sample analysis based on observed characteristics to examine the effect of more FWP usage on mortgage deal performance. This is achieved by matching observations selected using a number of covariates (including deal lead underwriters and issuance year) and then comparing the deal cumulative net loss for the two samples.

Table 9 about here

Table 9 reports the results of matching analysis on deal cumulative net loss with different levels of FWPs. We utilize three different sets of covariates to predict levels of FWPs. The first set of covariates include deal and macro variables, such as, the original collateral balance, high reputation, number of tranches, low documentation, FICO, LTV, adjustable rate mortgage, negative amortization, purchase loans, single family owner occupied, second lien, housing price change, credit spread and 10 year treasury. The second set of covariates add the textual variables (of the final prospectus supplement) such as total number of words and percent of uncertain words to those included in the first set. The third set of covariates add initial yield spread, subordination and over-collateralization to those included in the second set. All models match exactly on deal lead underwriters and issuance year. We use nearest-neighbor matching with replacement to implement one-to-one matching of treatment and control samples and the significance of the difference in cumulative net loss is based on a z-statistic which is computed using the analytical estimator of the asymptotic variance of matching estimators proposed by Abadie and Imbens (2006, 2008). The Abadie-Imbens robust standard errors are reported in the parenthesis below the estimates of the difference. Our results indicate that there is a statistically significant difference between the cumulative net loss in deals with multiple FWPs and deals with zero or one FWP. The cumulative net loss for deals with multiple (more frequent) FWPs is 2.6% to 3.8% higher than that for deals with zero or one (less frequent) FWP depending upon the set of covariates used. All five differences are statistically significant, consistent with our findings reported above.

5. Concluding Remarks

Securities Offering Reform (SOR) of December 2005 clarified and formalized free writing prospectus as a permittable written communication in securities offering process. The use of FWP has substantially relaxed the restrictions on communications during the offering process. Our study focuses on the effect of FWP usage in the ABS offering process. Investors in ABS are generally interested in the characteristics and quality of the underlying assets, the standards for their servicing, the timing and receipt of cash flows from those assets and the structure for distribution of those cash flows. This creates demand for timely communications in the public offering process by ABS investors. On the other hand, written communication in the form of FWPs may subject ABS issuers/underwriters to higher potential litigation risk and associated legal cost than alternative ways of communication such as oral communication. Thus, more FWP usage in the ABS offering process represents a more aggressive sales tactic and are more likely used for lower quality deals in the ABS offering process. In the meantime, withholding adverse information provides higher reward on lower quality deals than on higher quality deals. Consequently, everything else equal, issuers/underwriters use more FWPs to aggressively promote sales of ABS and also withhold adverse information on these deals to derive financial benefits. This suggests more FWP usage is associated with worse ABS performance, after controlling for the reported deal characteristics.

Using residential mortgage deals securitized in the two-years immediate following SOR, we find that the cumulative net loss of securitized mortgage deals is positively related to more FWP usage. This is robust to controlling for an extensive list of variables including deal characteristics, regional and macroeconomic conditions, and lead underwriter fixed effect. The finding suggests that MBS issuers/underwriters may have used the more aggressive tactic in the form of FWPs to promote sales of lower quality mortgage deals. To extract

financial benefit to compensate them for potential litigation risk and associated legal cost for more FWP usage, MBS issuers/underwriters may have withheld adverse information on these deals.

We perform various analyses to explore the relation between FWP usage and adverse information withholding as well as litigation risk hedging. First, we examine the relation between deal cumulative net loss and FWP usage controlling for mortgage deal pricing and credit enhancement in our analysis and find that deal cumulative net loss remains positively related to the FWP usage. This indicates that MBS issuers/underwriters may have withheld adverse information while using the more aggressive sales tactic in the form of FWPs to promote lower quality mortgage deals. Second, we investigate the relation between FWP usage and the uncertain text in the final prospectus and find that FWP usage is significantly positively associated with the uncertain text and also dramatically reduces the effect of the uncertain text on deal cumulative net loss when both are used in regression analysis. The uncertain text is documented in the textual analysis literature as a tactic by corporate managers to create contingencies to hedge litigation risk on information not disclosed. These findings have immediate implications for policymaking regarding communications in the public offering of mortgage-backed securities and possibly asset-backed securities in general.

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Appendix A: An incomplete list of SEC charged cases

- J.P. Morgan Securities – SEC charged the firm with misleading investors in offerings of residential mortgage-backed securities. J.P. Morgan Securities agreed to pay $296.9 million to settle the SEC's charges. (11/16/12)
  The SEC alleges that J.P. Morgan misstated information about the delinquency status of mortgage loans that provided collateral for an RMBS offering in which it was the underwriter.

- Credit Suisse Securities (USA) – SEC charged the firm with misleading investors in offering of residential mortgage-backed securities. Credit Suisse agreed to pay $120 million to settle the SEC's charges. (11/16/12)
  Credit Suisse misled investors by falsely claiming that "all First Payment Default Risk" was removed from its RMBS, and at the same time limiting the number of FPD loans that were put back to the originator.

- Bank of America – SEC charged Bank of America and two subsidiaries with defrauding investors in an offering of residential mortgage-backed securities by failing to disclose key risks and misrepresenting facts about the underlying mortgages. (8/6/13)
  As part of the global settlement, Bank of America agreed to resolve the SECs original case by paying disgorgement of $109.22 million, prejudgment interest of $6.62 million, and a penalty of $109.22 million. The settlement is subject to court approval. (8/21/14)

- RBS Securities – SEC charged the Royal Bank of Scotland subsidiary with misleading investors in a subprime RMBS offering. RBS agreed to settle the charges and pay $150 million for the benefit of harmed investors. (11/7/13)
  RBS told investors the loans backing the offering were "generally in accordance with" the lender's underwriting guidelines, which consider the value of the home relative to the mortgage and the borrower's ability to repay the loan. RBS knew or should have known that was false because due diligence before the offering showed that almost 30% of the loans underlying the offering did not meet the underwriting guidelines.

- Morgan Stanley – SEC charged three firm entities with misleading investors about the delinquency status of mortgage loans underlying two subprime residential mortgage-backed securities securitizations that the firms underwrote, sponsored, and issued. Morgan Stanley agreed to settle the charges by paying $275 million to be returned to harmed investors. (7/24/14)

Appendix B: Variable definitions

- Cumulative net loss: Historical percentages of cumulative loss on the underlying loans comprising the entire collateral that backs the deal
- No. of FWPs: Number of free writing prospectuses prior to the deal issuance date
- Multiple FWPs: Equals 1 if no. of FWPs is greater than 1; 0 otherwise
- Total number of words: Number of words in a deal's final prospectus supplement
- Pct of uncertain words: Percent of uncertain words in a deal's final prospectus supplement
- Total number of pages: Number of pages in a deal's final prospectus supplement
- Original collateral balance: The original balance of the underlying loans comprising the entire collateral
- High reputation: Equals 1 if the deal has an underwriter IPO reputation score greater than or equal to 8 (from Professor Jay Ritters website); 0 otherwise
- No. of tranches: Number of securities in a deal
- Low documentation: Dummy variable indicating underlying loans with limited, as distinguished from full, documentation
- FICO: Weighted average original credit score of the underlying loans
- LTV: Original loan to value percentage of the loan
- Adjustable rate mortgage: The percent of the adjustable rate mortgage loans
- Negative amortization: Equals 1 if the deal consists of mortgages with negative amortization features; 0 otherwise
- Purchase loans: The percent of the Loan Purpose (the reason for the loan) for Purchase
- Single family: percent of Single Family Mortgaged Properties, the type of properties against which the loans were written
- Owner occupied: percent of the Occupancy (the purpose of the property) for Owner Occupied
- Second lien: percentage of the loans comprising the collateral that are second lien

Table 1: Summary statistics

This table presents the summary statistics on the variables defined in the Appendix B. The statistics reported include N (number of observations), Mean, St. Dev. (standard deviation), the k^{th} percentile (Pk for $k = 5, 25, 50, 75, 95$) of each variable.

	N	Mean	St. Dev.	P5	P25	P50	P75	P95
Cumulative net loss (%)	1577	12.05	8.57	1.18	4.49	10.82	18.16	28.05
No. of FWPs	1743	1.63	1.82	0	0	1	3	5
Multiple FWPs (d)	1743	0.43	0.50	0	0	0	1	1
Total number of words (×1000)	1717	52.22	15.14	30.51	42.51	52.17	60.78	74.99
Pct of uncertain words (in %)	1717	2.835	0.359	2.294	2.600	2.800	3.032	3.460
Total number of pages	1485	118	34.28	59	98	118	137	176
Original collateral balance ($ Billion)	1743	0.87	0.52	0.28	0.49	0.76	1.10	1.87
High reputation (d)	1743	0.72	0.45	0	0	1	1	1
No. of tranches	1743	22.45	11.80	11	16	19	25	45
Low documentation (d)	1587	0.61	0.49	0	0	1	1	1
FICO	1743	693	44.08	613	666	705	724	747
LTV (75% quartile)	1716	79.06	5.61	71	76	79	82	88
Adjustable rate mortgage	1743	60.13	38.49	0	0	68.75	100	100
Negative amortization (d)	1743	0.10	0.30	0	0	0	0	1
Purchase loans	1743	44.38	13.83	19.06	37.31	43.18	53.41	68.01
Single Family	1743	67.39	9.46	54.94	62.15	68.46	71.42	85.04
Owner occupied	1743	87.17	7.79	71.87	84.39	87.58	92.90	96.51
Second lien	1743	0.78	2.18	0	0	0	0	5.51

Table 2: Correlation matrix

This table presents the correlation coefficients between the main variables of interest and other explanatory variables. All the variables are defined in the Appendix B.

	Cum. net loss	No. of FWPs	Multiple FWPs	Total no. of words	Pct uncertain words	Total no. of pages
Cumulative net loss	1.00					
No. of FWPs	0.41***	1.00				
Multiple FWPs	0.42***	0.78***	1.00			
Total number of words	0.41***	0.15***	0.08***	1.00		
Pct of uncertain words	0.09***	0.26***	0.31***	-0.21***	1.00	
Total number of pages	0.39***	0.12***	0.07**	0.71***	-0.36***	1.00
Original collateral balance	0.21***	0.18***	0.15***	0.29***	-0.08***	0.26***
High reputation	0.09***	0.14***	0.08***	0.10***	0.20***	-0.06**
No. of tranches	-0.12***	-0.12***	-0.17***	0.26***	-0.28***	0.28***
Low documentation	-0.25***	-0.26***	-0.27***	-0.11***	-0.19***	-0.06*
FICO	-0.59***	-0.35***	-0.37***	-0.24***	-0.06**	-0.28***
LTV	0.51***	0.27***	0.28***	0.15***	0.05*	0.19***
Adjustable rate mortgage	0.38***	0.15***	0.17***	0.15***	-0.02	0.19***
Negative amortization	0.06**	-0.04*	-0.06***	0.07**	-0.14***	0.13***
Purchase loans	-0.04*	-0.04*	-0.05**	-0.13***	0.13***	-0.21***
Single Family	0.03	0.17***	0.22***	-0.06**	0.25***	-0.12***
Owner occupied	0.02	0.09***	0.12***	-0.03	0.01	-0.00
Second lien	0.41***	0.19***	0.24***	0.07**	0.19***	0.11***

Table 3: Determinants of the Use of FWPs

This table presents the results of analyzing the determinants of FWP usage. All the variables are defined in the Appendix B. The number of FWPs is regressed on other explanatory variables using poisson regression. The Multiple FWPs is regressed on other explanatory variables using logistic regression. The t-statistics based on standard errors clustered at lead-underwriter-level are reported in the parentheses below each coefficient estimate. Statistical significance levels of 1%, 5%, and 10% are indicated with ***, **, and * respectively.

	Number of FWPs	Multiplicity of FWPs
Original collateral balance	0.28***	0.51***
	(6.60)	(3.23)
High reputation	0.37**	0.59*
	(2.27)	(1.89)
No. of tranches	-0.01*	-0.02**
	(-1.67)	(-2.35)
Low documentation	-0.15	-0.48*
	(-1.56)	(-1.93)
FICO	-0.01***	-0.01**
	(-5.33)	(-2.46)
LTV	0.02*	0.04
	(1.74)	(1.64)
Adjustable rate mortgage	0.00	0.01*
	(1.37)	(1.82)
Negative amortization	0.05	-0.26
	(0.20)	(-0.63)
Purchase loans	0.00	0.01
	(1.14)	(0.65)
Single family	0.01**	0.04**
	(2.42)	(2.45)
Owner occupied	-0.01**	-0.01
	(-2.03)	(-1.55)
Second lien	-0.02	0.05
	(-1.48)	(1.27)
Pseudo R^2	0.104	0.175
N	1580	1580
Lead underwriter FE	Yes	Yes
Year FE	Yes	Yes

Table 4: Cumulative net loss and FWP usage

This table reports the results of how FWP usage affects the future performance of the underlying loans in terms of cumulative net loss (the dependent variable). The main independent variables of interest are No. of FWPs and Multiple FWPs. The other deal characteristic variables are defined in the Appendix B. We also control for the macroeconomic conditions including 10-year treasury rate, credit spread, and house prices change. We define house prices change as the average house price changes from deal quarter to the end of 2010 for each deal using the state level Federal Housing Finance Agency's (FHFA) seasonally adjusted quarterly house price index. The weighted average for each deal is taken over the top five states by their mortgage balance assuming the remaining 46 states have equal representation. The t-statistics based on standard errors clustered at lead-underwriter-level are reported in the parentheses below each coefficient estimate. Statistical significance levels of 1%, 5%, and 10% are indicated with ***, **, and * respectively.

	(1)	(2)	(3)	(4)
No. of FWPs	1.75***		0.67***	
	(11.60)		(5.81)	
Multiple FWPs		6.30***		2.35***
		(7.87)		(4.15)
Original collateral balance			-0.47	-0.40
			(-1.50)	(-1.21)
High reputation			-0.13	-0.04
			(-0.16)	(-0.05)
No. of tranches			0.08**	0.08**
			(2.15)	(2.20)
Low documentation			0.95*	1.00*
			(2.05)	(2.04)
FICO			-0.11***	-0.11***
			(-6.96)	(-7.26)
LTV			0.23***	0.23***
			(3.95)	(4.00)
Adjustable rate mortgage			0.02**	0.02**
			(2.57)	(2.49)
Negative amortization			1.57*	1.79**
			(2.01)	(2.20)
Purchase loans			0.13***	0.13***
			(5.85)	(5.73)
Single family			-0.05**	-0.05**
			(-2.10)	(-2.40)
Owner occupied			-0.12***	-0.12***
			(-8.74)	(-9.62)

Continued on Next Page...

Table 4 – Continued

	(1)	(2)	(3)	(4)
Second lien			0.81***	0.79***
			(3.62)	(3.70)
House prices change	-0.22***	-0.23***	-0.36***	-0.36***
	(-3.73)	(-3.83)	(-6.33)	(-6.48)
Credit spread	-7.12	-7.57	-5.65	-5.96
	(-1.31)	(-1.28)	(-1.36)	(-1.43)
10 Year Treasury	-0.08	0.15	-0.71	-0.66
	(-0.15)	(0.21)	(-1.23)	(-1.13)
Adj. R^2	0.313	0.306	0.669	0.667
N	1577	1577	1460	1460
Lead underwriter FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Table 5: FWP effect controlling for pricing variables

This table reports the results of analyzing whether FWP usage has incremental effect on the performance of the underlying loans in terms of cumulative net loss (the dependent variable) after controlling for investor's information set reflected in the initial pricing variables. The initial pricing variables include the initial deal yield spread, credit enhancement variables subordination and over-collateralization. The initial yield spread is defined as the average yield of all securities issued by the trust weighted by the face value of the securities and the yield on the 10-year Treasury bond as reported by Bloomberg; subordination is defined as the percentage of the face value of trust securities not rated AAA by Moody's or Standard & Poors at deal close; and over-collateralization is defined as a dummy variable capturing whether the balance of underlying mortgages exceeds the face value of issued securities. All the other variables are defined as in previous tables. The t-statistics based on standard errors clustered at lead-underwriter-level are reported in the parentheses below each coefficient estimate. Statistical significance levels of 1%, 5%, and 10% are indicated with ***, **, and * respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
No. of FWPs	0.51***		0.39***		0.35***	
	(5.15)		(3.34)		(3.21)	
Multiple FWPs		1.81***		1.39***		1.25**
		(4.00)		(2.84)		(2.62)
Initial yield spread	2.02***	2.05***	1.87***	1.89***	1.76***	1.77***
	(5.45)	(5.55)	(5.43)	(5.49)	(5.42)	(5.49)
Subordination	0.20**	0.20**			0.20**	0.20**
	(2.42)	(2.34)			(2.45)	(2.39)
Over-collateralization			4.61***	4.65***	4.60***	4.64***
			(7.08)	(7.12)	(7.26)	(7.27)
Original collateral balance	-0.08	-0.02	-0.51	-0.47	-0.44	-0.40
	(-0.23)	(-0.05)	(-1.64)	(-1.48)	(-1.40)	(-1.25)
High reputation	-0.05	0.02	-0.40	-0.35	-0.36	-0.32
	(-0.05)	(0.02)	(-0.47)	(-0.41)	(-0.45)	(-0.39)
No. of tranches	0.08**	0.08**	0.09***	0.09***	0.09***	0.09***
	(2.36)	(2.42)	(2.80)	(2.85)	(2.89)	(2.94)
Low documentation	0.86**	0.89**	0.40	0.43	0.59*	0.61*
	(2.22)	(2.20)	(1.18)	(1.22)	(1.89)	(1.89)
FICO	-0.06***	-0.06***	-0.06***	-0.06***	-0.03*	-0.03*
	(-2.98)	(-3.02)	(-4.26)	(-4.42)	(-1.85)	(-1.89)
LTV	0.13***	0.13***	0.09**	0.09**	0.07*	0.07*
	(3.33)	(3.32)	(2.17)	(2.12)	(2.01)	(1.94)
Adjustable rate mortgage	0.02**	0.02**	0.02***	0.02***	0.02**	0.02**
	(2.67)	(2.60)	(3.01)	(2.99)	(2.38)	(2.34)

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Table 5 – Continued

	(1)	(2)	(3)	(4)	(5)	(6)
Negative amortization	2.86***	3.04***	2.70***	2.84***	2.42***	2.54***
	(4.12)	(4.33)	(4.63)	(4.81)	(4.86)	(5.08)
Purchase loans	0.13***	0.14***	0.13***	0.13***	0.13***	0.13***
	(6.55)	(6.45)	(6.85)	(6.87)	(6.95)	(6.94)
Single family	-0.06***	-0.06***	-0.04***	-0.05***	-0.05***	-0.06***
	(-3.65)	(-4.10)	(-2.82)	(-3.08)	(-3.89)	(-4.15)
Owner occupied	-0.12***	-0.12***	-0.09***	-0.09***	-0.10***	-0.10***
	(-7.51)	(-7.62)	(-5.51)	(-5.42)	(-6.00)	(-5.95)
Second lien	0.68***	0.67***	0.79***	0.78***	0.73***	0.72***
	(3.51)	(3.57)	(3.53)	(3.59)	(3.60)	(3.65)
House prices change	-0.40***	-0.40***	-0.34***	-0.34***	-0.35***	-0.35***
	(-7.69)	(-7.77)	(-7.03)	(-7.08)	(-6.93)	(-6.95)
Credit spread	-3.24	-3.45	-4.00	-4.17	-3.00	-3.14
	(-0.80)	(-0.85)	(-1.08)	(-1.13)	(-0.86)	(-0.91)
10 Year Treasury	0.70	0.75	0.37	0.41	0.70	0.74
	(1.43)	(1.52)	(0.80)	(0.85)	(1.49)	(1.54)
Adj. R^2	0.704	0.703	0.726	0.726	0.732	0.732
N	1460	1460	1460	1460	1460	1460
Lead underwriter FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 6: Determinants of Prospectus Content

This table reports the results of analyzing the determinants of final prospectus supplement content, with a particular focus on how FWP frequency affects the content complexity and the use of uncertain words. The dependent variable is the total number of words in columns (1) and (2), the percent of uncertain words in columns (3) and (4), and the total number of pages in columns (5) and (6). All the variables are defined in the Appendix B. The t-statistics based on standard errors clustered at lead-underwriter-level are reported in the parentheses below each coefficient estimate. Statistical significance levels of 1%, 5%, and 10% are indicated with ***, **, and * respectively.

	Total no. of words		Pct of uncertain words		Total no. of pages	
	(1)	(2)	(3)	(4)	(5)	(6)
No. of FWPs	0.63**		0.03***		1.58	
	(2.26)		(3.32)		(1.31)	
Multiple FWPs		0.79		0.10***		3.34
		(0.78)		(3.85)		(0.88)
Original collateral balance	3.61***	3.83***	-0.02	-0.02	7.23***	7.59***
	(5.63)	(5.56)	(-1.20)	(-1.01)	(3.32)	(3.40)
High reputation	3.19*	3.40*	-0.00	0.00	-1.17	-0.99
	(1.76)	(1.84)	(-0.04)	(0.02)	(-0.33)	(-0.29)
No. of tranches	0.40***	0.40***	-0.01***	-0.01***	0.92***	0.91***
	(6.50)	(6.33)	(-6.66)	(-6.61)	(5.58)	(5.41)
Low documentation	-0.96	-1.05	-0.04**	-0.04*	0.57	0.41
	(-1.10)	(-1.20)	(-2.18)	(-1.99)	(0.22)	(0.16)
FICO	-0.09***	-0.09***	0.00**	0.00**	-0.24***	-0.25***
	(-5.83)	(-6.22)	(2.46)	(2.11)	(-4.26)	(-4.33)
LTV	0.18**	0.19**	-0.00*	-0.00*	0.58**	0.59**
	(2.25)	(2.41)	(-1.87)	(-1.94)	(2.24)	(2.31)
Adjustable rate mortgage	0.06**	0.06**	-0.00	-0.00	0.09*	0.09*
	(2.64)	(2.66)	(-0.74)	(-0.83)	(2.01)	(1.99)
Negative amortization	1.27	1.35	0.00	0.01	5.72	6.02
	(0.49)	(0.54)	(0.07)	(0.22)	(1.47)	(1.57)
Purchase loans	-0.05*	-0.05	0.00**	0.00**	-0.26***	-0.26***
	(-1.80)	(-1.70)	(2.72)	(2.74)	(-3.05)	(-3.03)
Single family	-0.11**	-0.11**	0.01***	0.01***	-0.53***	-0.53***
	(-2.49)	(-2.41)	(4.09)	(4.00)	(-3.54)	(-3.51)
Owner occupied	-0.19**	-0.19**	-0.00	-0.00	-0.22	-0.22
	(-2.24)	(-2.32)	(-1.15)	(-1.15)	(-1.23)	(-1.25)
Second lien	0.19	0.18	0.01*	0.01	-0.23	-0.32
	(0.82)	(0.77)	(1.86)	(1.54)	(-0.24)	(-0.33)
Adj. R^2	0.352	0.349	0.321	0.320	0.404	0.401
N	1555	1555	1555	1555	1333	1333
Lead underwriter FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 7: Cumulative net loss, FWP usage, and prospectus content

This table reports the results of how FWP frequency and the content of final prospectus supplement jointly affect the future performance of the underlying loans in terms of cumulative net loss (the dependent variable). All the variables are defined as in previous tables. The t-statistics based on standard errors clustered at lead-underwriter-level are reported in the parentheses below each coefficient estimate. Statistical significance levels of 1%, 5%, and 10% are indicated with ***, **, and * respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
No. of FWPs	0.62***			0.59***		
	(5.30)			(4.02)		
Multiple FWPs		2.21***			2.13***	
		(3.91)			(3.18)	
Pct of uncertain words (×100)	0.92	0.98	1.45**	1.20**	1.19**	1.74***
	(1.55)	(1.69)	(2.73)	(2.19)	(2.25)	(3.26)
Total number of words (/1000)	0.08***	0.08***	0.09***			
	(3.64)	(3.86)	(3.85)			
Total number of pages				0.04***	0.04***	0.04***
				(3.96)	(4.27)	(3.87)
Original collateral balance	-0.74**	-0.68**	-0.54*	-0.75*	-0.72	-0.56
	(-2.57)	(-2.31)	(-1.87)	(-1.80)	(-1.71)	(-1.41)
High reputation	-0.35	-0.28	-0.17	-0.48	-0.49	-0.37
	(-0.43)	(-0.34)	(-0.19)	(-0.84)	(-0.88)	(-0.62)
No. of tranches	0.05*	0.05*	0.05	0.04*	0.04*	0.04
	(1.87)	(1.89)	(1.69)	(1.85)	(1.84)	(1.56)
Low documentation	1.06**	1.11**	1.05*	1.08*	1.05*	1.04
	(2.33)	(2.31)	(2.03)	(1.77)	(1.72)	(1.59)
FICO	-0.10***	-0.10***	-0.11***	-0.09***	-0.09***	-0.10***
	(-6.92)	(-7.17)	(-7.30)	(-6.34)	(-6.59)	(-6.49)
LTV	0.22***	0.22***	0.22***	0.21***	0.21***	0.21***
	(3.75)	(3.79)	(3.47)	(3.31)	(3.37)	(3.10)
Adjustable rate mortgage	0.01**	0.01*	0.02*	0.02**	0.02**	0.02**
	(2.12)	(2.00)	(2.00)	(2.25)	(2.07)	(2.11)
Negative amortization	1.54*	1.73**	1.70*	1.13	1.26	1.30
	(1.96)	(2.10)	(1.90)	(1.19)	(1.31)	(1.27)
Purchase loans	0.13***	0.13***	0.13***	0.13***	0.13***	0.13***
	(5.71)	(5.58)	(5.92)	(4.75)	(4.71)	(4.83)
Single family	-0.04*	-0.05**	-0.03	-0.03	-0.03*	-0.02
	(-1.98)	(-2.26)	(-1.43)	(-1.50)	(-1.73)	(-0.86)
Owner occupied	-0.10***	-0.10***	-0.10***	-0.09***	-0.09***	-0.09***
	(-7.18)	(-7.98)	(-7.87)	(-4.75)	(-5.05)	(-4.66)
Second lien	0.78***	0.76***	0.78***	0.83***	0.80***	0.82***
	(3.31)	(3.36)	(3.26)	(3.19)	(3.20)	(3.16)
House prices change	-0.36***	-0.36***	-0.36***	-0.33***	-0.33***	-0.33***
	(-6.00)	(-6.12)	(-5.61)	(-4.73)	(-4.70)	(-4.26)
Credit spread	-4.06	-4.29	-3.74	-7.51*	-7.83*	-7.22*
	(-1.01)	(-1.08)	(-0.92)	(-1.85)	(-1.99)	(-1.76)
10 Year Treasury	-0.58	-0.51	-0.45	-1.13	-1.13*	-1.03
	(-0.95)	(-0.83)	(-0.69)	(-1.66)	(-1.73)	(-1.43)
Adj. R^2	0.680	0.679	0.668	0.674	0.673	0.663
N	1436	1436	1436	1222	1222	1222
Lead underwriter FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 8: FWP effect, pricing variables, and prospectus content

This table reports the results of analyzing whether FWP usage has incremental effect on the performance of the underlying loans in terms of cumulative net loss (the dependent variable) after controlling for investor's information set reflected in the initial pricing variables as well as the prospectus uncertainty and complexity. The initial pricing variables include the initial deal yield spread, credit enhancement variables subordination and over-collateralization. The initial yield spread is defined as the average yield of all securities issued by the trust weighted by the face value of the securities and the yield on the 10-year Treasury bond as reported by Bloomberg; subordination is defined as the percentage of the face value of trust securities not rated AAA by Moody's or Standard & Poors at deal close; and over-collateralization is defined as a dummy variable capturing whether the balance of underlying mortgages exceeds the face value of issued securities. All the other variables are defined as in previous tables. The t-statistics based on standard errors clustered at lead-underwriter-level are reported in the parentheses below each coefficient estimate. Statistical significance levels of 1%, 5%, and 10% are indicated with ***, **, and * respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
No. of FWPs	0.46***		0.36***		0.32***	
	(4.54)		(2.98)		(2.83)	
Multiple FWPs		1.67***		1.31**		1.17**
		(3.72)		(2.63)		(2.43)
Initial yield spread	1.98***	2.01***	1.87***	1.88***	1.76***	1.77***
	(5.20)	(5.28)	(5.30)	(5.36)	(5.31)	(5.38)
Subordination	0.21**	0.21**			0.20**	0.20**
	(2.42)	(2.34)			(2.44)	(2.38)
Over-collateralization			4.28***	4.30***	4.25***	4.26***
			(6.96)	(7.00)	(7.21)	(7.21)
Total number of words (/1000)	0.08***	0.08***	0.06***	0.06***	0.06***	0.06***
	(3.42)	(3.55)	(2.92)	(3.04)	(3.11)	(3.22)
Pct of uncertain words (×100)	0.92	0.95*	1.14**	1.17**	1.07**	1.09**
	(1.59)	(1.71)	(2.35)	(2.50)	(2.25)	(2.39)
Original collateral balance	-0.34	-0.30	-0.69**	-0.66**	-0.62**	-0.60*
	(-1.07)	(-0.91)	(-2.43)	(-2.29)	(-2.12)	(-1.98)
High reputation	-0.26	-0.21	-0.54	-0.50	-0.51	-0.47
	(-0.30)	(-0.24)	(-0.59)	(-0.55)	(-0.59)	(-0.55)
No. of tranches	0.05**	0.05**	0.07***	0.07***	0.07***	0.07***
	(2.07)	(2.10)	(2.97)	(2.99)	(2.97)	(2.99)
Low documentation	0.98**	1.02**	0.54	0.57	0.73**	0.75**
	(2.59)	(2.56)	(1.62)	(1.64)	(2.39)	(2.36)
FICO	-0.05**	-0.05**	-0.06***	-0.06***	-0.03*	-0.03*
	(-2.73)	(-2.74)	(-4.17)	(-4.30)	(-1.72)	(-1.74)

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Table 8 – Continued

	(1)	(2)	(3)	(4)	(5)	(6)
LTV	0.12***	0.12***	0.09**	0.09**	0.07**	0.07*
	(3.15)	(3.14)	(2.20)	(2.17)	(2.07)	(2.02)
Adjustable rate mortgage	0.01**	0.01**	0.02**	0.01**	0.01*	0.01*
	(2.21)	(2.10)	(2.63)	(2.57)	(2.00)	(1.93)
Negative amortization	2.80***	2.95***	2.74***	2.85***	2.44***	2.54***
	(4.12)	(4.27)	(4.88)	(5.01)	(5.13)	(5.29)
Purchase loans	0.13***	0.13***	0.13***	0.13***	0.13***	0.13***
	(6.48)	(6.37)	(6.63)	(6.63)	(6.72)	(6.69)
Single family	-0.06***	-0.06***	-0.05**	-0.05***	-0.06***	-0.06***
	(-3.64)	(-4.03)	(-2.70)	(-2.94)	(-3.78)	(-4.04)
Owner occupied	-0.10***	-0.10***	-0.08***	-0.08***	-0.09***	-0.09***
	(-5.76)	(-5.85)	(-5.15)	(-5.12)	(-5.38)	(-5.37)
Second lien	0.65***	0.63***	0.76***	0.75***	0.70***	0.69***
	(3.13)	(3.17)	(3.23)	(3.27)	(3.26)	(3.29)
House prices change	-0.39***	-0.39***	-0.35***	-0.35***	-0.35***	-0.35***
	(-7.44)	(-7.51)	(-6.94)	(-6.98)	(-6.87)	(-6.88)
Credit spread	-1.62	-1.78	-2.50	-2.63	-1.48	-1.59
	(-0.41)	(-0.45)	(-0.68)	(-0.72)	(-0.42)	(-0.46)
10 Year Treasury	0.84	0.90	0.46	0.50	0.81	0.85
	(1.57)	(1.66)	(0.89)	(0.95)	(1.53)	(1.59)
Adj. R^2	0.716	0.715	0.733	0.733	0.739	0.739
N	1436	1436	1436	1436	1436	1436
Lead underwriter FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 9: Difference in cumulative net loss between deals with different FWPs using matching approach

The table uses nearest-neighbor matching to match deals from multiple (more) FWP sample to deals from one or zero (fewer) FWP sample. In models (1), (4) and (5), the more FWP sample includes deals with multiple FWPs (i.e., no of FWPs > 1) and the matching sample includes deals with zero or one FWP. In model (2), the more FWP sample includes deals with one FWP and the matching sample includes deals with zero FWP. In model (3), the more FWP sample includes deals with multiple FWPs and the matching sample includes deals with one FWP. The deal and macro matching covariates include original collateral balance, high reputation, No. of tranches, low documentation, FICO, LTV, adjustable rate mortgage, negative amortization, purchase loans, single family owner occupied, second lien, housing price change, credit spread and 10 year treasury. The textual matching covariates include total number of words and percent of uncertain words from prospectus supplement. The pricing matching covariates include initial yield spread, subordination and over-collateralization. All models match exactly on deal lead underwriters and issuance year. We use nearest-neighbor matching with replacement to implement one-to-one matching of more FWP and fewer FWP samples and the significance of the difference in cumulative net loss is based on a z-statistic which is computed using the analytical estimator of the asymptotic variance of matching estimators proposed by Abadie and Imbens (2006, 2008). The A.I. robust z-statistics are reported in the parenthesis below the estimates of the difference. The reported number of observations in each model is the combined samples before matching. Statistical significance levels of 1%, 5%, and 10% are indicated with ***, **, and * respectively.

	(1)	(2)	(3)	(4)	(5)
Difference in Cumulative Net Loss	3.78***	2.56***	2.71***	3.79***	2.73***
	(7.68)	(5.48)	(4.14)	(7.27)	(5.62)
More FWP sample (no of FWPs)	> 1	1	> 1	> 1	> 1
Matching sample (no of FWPs)	≤ 1	0	1	≤ 1	≤ 1
Deal and macro matching covariates	Yes	Yes	Yes	Yes	Yes
Textual matching covariates	No	No	No	Yes	Yes
Pricing matching covariates	No	No	No	No	Yes
N	1460	836	955	1436	1436

Figure 1: Average cumulative net loss for deals with/without multiple FWPs

The top figure plots the total number of deals in each issuance month between 2006 and 2007. The bottom figure plots the average cumulative net loss (in percentage) for deals with and without multiple FWPs in each issuance month between 2006 and 2007. Red starred line represents the average cumulative net loss for deals with multiple FWPs. Blue dotted line represents the average cumulative net loss for deals with zero or one FWP.